

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Sow-Fun Hon Examiner #: 77463 Date: 03/09/05
 Art Unit: 1772 Phone Number: 302-1492 Serial Number: 1016301778
 Mail Box and Bldg/Room Location: REM 3 B49 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: PHOTO-ALIGNMENT MATERIALInventors (please provide full names): MI SOOK NAMEarliest Priority Filing Date: 12/05/02

**For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

I ALREADY HAVE A REFERENCE TO REJECT THE
 BROADEST CLAIM EMBODIMENT, WHERE IN

$[A]_a [B]_b [C]_c : b = c = \emptyset$

SO I AM LOOKING FOR THE OTHERS.

STAFF USE ONLY**Type of Search****Vendors and cost where applicable**

Searcher: K. Fuller NA Sequence (#) _____ STN ✓
 Searcher Phone #: _____ AA Sequence (#) _____ Dialog _____
 Searcher Location: _____ Structure (#) 6 Questel/Orbit _____
 Date Searcher Picked Up: _____ Bibliographic _____ Dr. Link _____
 Date Completed: 3/15/05 Litigation _____ Lexis/Nexis _____
 Searcher Prep & Review Time: 40 Fulltext _____ Sequence Systems _____
 Clerical Prep Time: _____ Patent Family _____ WWW/Internet _____
 Online Time: 64 Other _____ Other (specify) _____



STIC Search Report

EIC 1700

STIC Database Tracking Number: 147256

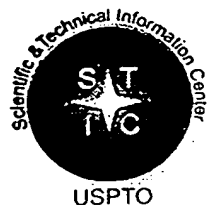
TO: Sow-Fun Hon
Location: REM 8B49
Art Unit : 1772 7011
March 15, 2005

Case Serial Number: 10/630738

From: Kathleen Fuller
Location: EIC 1700
REMSSEN 4B28
Phone: 571/272-2505
Kathleen.Fuller@uspto.gov

Search Notes

It was practically impossible to construct a structure search for this application. Chemical abstracts does not index any structure/registry numbers for the application except for silica. This indicates that this is probably not structurally defined and not searchable. However, I did a reverse search as nothing else would run to completion. I extracted RN's from references on the topic of the application and ran this incredibly broad search query against this set of RN's rather than the 30 million in the Registry file. I hope there is something you can use.



STIC Search Results Feedback Form

EIC17000

Questions about the scope or the results of the search? Contact *the EIC searcher* or contact:

Kathleen Fuller, EIC 1700 Team Leader
571/272-2505 REMSEN 4B28

Voluntary Results Feedback Form

- I am an examiner in Workgroup: Example: 1713
➤ Relevant prior art **found**, search results used as follows:

- ☐ 102 rejection
- ☐ 103 rejection
- ☐ Cited as being of interest.
- ☐ Helped examiner better understand the invention.
- ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature
(journal articles, conference proceedings, new product announcements etc.)

➤ Relevant prior art **not found**:

- ☐ Results verified the lack of relevant prior art (helped determine patentability).
- ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to EIC1700 REMSEN 4B28



=> FILE REG

FILE 'REGISTRY' ENTERED AT 18:07:26 ON 15 MAR 2005
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
COPYRIGHT (C) 2005 American Chemical Society (ACS)

Property values tagged with IC are from the ZIC/VINITI data file provided by InfoChem.

STRUCTURE FILE UPDATES: 14 MAR 2005 HIGHEST RN 845540-96-7
DICTIONARY FILE UPDATES: 14 MAR 2005 HIGHEST RN 845540-96-7

TSCA INFORMATION NOW CURRENT THROUGH JANUARY 18, 2005

Please note that search-term pricing does apply when conducting SmartSELECT searches.

Crossover limits have been increased. See HELP CROSSOVER for details.

Experimental and calculated property data are now available. For more information enter HELP PROP at an arrow prompt in the file or refer to the file summary sheet on the web at:
<http://www.cas.org/ONLINE/DBSS/registryss.html>

=> FILE HCAPLU

FILE 'HCAPLU' ENTERED AT 18:07:30 ON 15 MAR 2005
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FILE COVERS 1907 - 15 Mar 2005 VOL 142 ISS 12
FILE LAST UPDATED: 14 Mar 2005 (20050314/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

Tipt

=> D QUE

L21	2147	SEA FILE=HCAPLU	ABB=ON	PHOTO?(2A)?ALIGN?
L22	158890	SEA FILE=HCAPLU	ABB=ON	LIQ?(2A)?CRYST?
L24	14183	SEA FILE=HCAPLU	ABB=ON	L22(5A)?LAYER?
L51	2	SEA FILE=HCAPLU	ABB=ON	L21 AND ETHEN?(3A)(REACT? OR GROUP?)
L52	3	SEA FILE=HCAPLU	ABB=ON	L21 AND ETHEN?(3A)PHOTO?
L53	3	SEA FILE=HCAPLU	ABB=ON	L51 OR L52
L54	403	SEA FILE=HCAPLU	ABB=ON	PHOTOG?/SC AND ETHEN?(3A)(PHOTO? OR REACT? OR GROUP?)
L55	1	SEA FILE=HCAPLU	ABB=ON	L24 AND L54
L56	3	SEA FILE=HCAPLU	ABB=ON	L53 OR L55

KATHLEEN FULLER EIC 1700 REMSEN 4B28 571/272-2505

=> D L56 BIB ABS IND HITSTR 1-3

L56 ANSWER 1 OF 3 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:835952 HCAPLUS

DN 142:23812

TI Soluble polyimide containing a photoreactive 2-styrylpyridine derivative as the side group: Synthesis and characterization

AU Kim, Woo-Sik; Ahn, Deuk-Kyoon; Kim, Min-Woo

CS Department of Polymer Science, College of Engineering, Kyungpook National University, Taegu, 702-701, S. Korea

SO Macromolecular Chemistry and Physics (2004), 205(14), 1932-1937

CODEN: MCHPES; ISSN: 1022-1352

PB Wiley-VCH Verlag GmbH & Co. KGaA

DT Journal

LA English

AB The synthesis and characterization of a soluble photoreactive polyimide are described.. The precursor of the polyimide was prepared from 2,2'-bis{4-(3,4-dicarboxyphenoxy)phenyl}hexafluoropropane dianhydride and 3,3'-hydroxy-4,4'-diaminobiphenyl; the photoreactive polyimide was then prepared by the polymer reaction of the hydroxyl groups in the precursor polymer with 2-{2-[4-(6-hydroxyhexyloxy)phenyl]ethenyl}pyridine as a **photoreactive** 2-styrylpyridine derivative. The photoreactive polymer and its precursor polymer were soluble in various polar organic solvents, and their thin flexible films were easily formed by solution casting. The initial decomposition temps. of the former and latter polymers were 350° and 470°, resp. The extent of the photochem. reaction of the photoreactive polymer film was measured to be 65.8% at an exposure energy of 1.5 J/cm². The transmittance of the film was found to be approx. 92% at room temperature and approx. 85% at 200°. These results suggest that the polyimide is a photosensitive polymer with good photosensitivity and high optical transparency. The dichroic ratios of the film were between 0.023 and 0.025 when exposed to linearly polarized UV light (LPUVL). The liquid crystal in the film cell was perpendicularly oriented to the elec. vector of LPUVL.

CC 37-3 (Plastics Manufacture and Processing)

ST styrylpyridine contg photoreactive polyimide prepn property;

photoalignment liq cryst **photoreactive** polyimide

IT Polyimides, preparation

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(polyether-, fluorine-containing; synthesis and characterization of soluble polyimide containing photoreactive 2-styrylpyridine derivative as side

group)

IT Fluoropolymers, preparation

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(polyether-polyimide-; synthesis and characterization of soluble polyimide containing photoreactive 2-styrylpyridine derivative as side group)

IT Polyethers, preparation

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(polyimide-, fluorine-containing; synthesis and characterization of soluble polyimide containing photoreactive 2-styrylpyridine derivative as side

group)

IT Thermal stability

Transparency

(synthesis and characterization of soluble polyimide containing

photoreactive

2-styrylpyridine derivative as side group)

IT Liquid crystal displays

UV and visible spectra

(synthesis of soluble polyimide containing photoreactive 2-styrylpyridine derivative as side group for liquid crystal alignment in)

IT 40817-08-1, 4-Pentyl-4'-cyanobiphenyl

RL: NUU (Other use, unclassified); USES (Uses)

(liquid crystalline; synthesis of soluble polyimide containing photoreactive 2-styrylpyridine derivative as side group for alignment of)

IT 791521-65-8P 791521-66-9P

RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(synthesis and characterization of soluble polyimide containing photoreactive

2-styrylpyridine derivative as side group)

IT 791521-65-8DP, reaction products with [[(hydroxyhexyloxy)phenyl]ethenyl]pyridine 791521-66-9DP, reaction products with

[[[(hydroxyhexyloxy)phenyl]ethenyl]pyridine 801219-35-2DP, reaction products with hydroxy-containing polyimide

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(synthesis and characterization of soluble polyimide containing photoreactive

2-styrylpyridine derivative as side group)

RE.CNT 37 THERE ARE 37 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L56 ANSWER 2 OF 3 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2002:450164 HCAPLUS

DN 137:13359

TI **Photo-alignment** material and liquid crystal display device and its manufacturing method using the same

IN Nam, Mi Sook

PA S. Korea

SO U.S. Pat. Appl. Publ., 17 pp.

CODEN: USXXCO

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002071079	A1	20020613	US 2001-893977	20010629
	US 6627269	B2	20030930		
	KR 2002044270	A	20020615	KR 2000-73270	20001205
	US 2004022963	A1	20040205	<u>US 2003-630738</u>	20030731
	US 2004022964	A1	20040205	US 2003-630781	20030731
	US 6797096	B2	20040928		
PRAI	KR 2000-73270	A	20001205		
	US 2001-893977	A3	20010629		

AB The present invention relates to a **photo-alignment** material, a liquid crystal display device using the **photo-alignment** material, and a manufacturing method. The **photo-alignment** material is a polymer having a **photo-reactive ethenyl group** on a main chain. When used as a **photo-alignment** layer, the **photo-alignment** material enables improved alignment stability against external shocks, light, and heat. The liquid crystal display device includes a first substrate, a second substrate, a **liquid crystal layer** formed between the first and second substrates, and a **photo-alignment** layer formed at least on the first substrate, with the **photo-alignment** layer formed from a **photo-alignment** material having an

*Applicant
Note that it indexes no
structure/RN's for this patent
except for SiO₂. Could they
be puzzled by
the claims
too?*

ethenyl group at a main chain.
 ICM G02F001-1337
 NCL 349124000
 CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)
 ST liq crystal display photoalignment material
 IT Liquid crystal displays
 (**photo-alignment** material for)
 IT Light
 (**photo-alignment** material for liquid crystal display device)
 IT Polyamic acids
 Polyamides, uses
 Polyimides, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (rubbing **alignment layer; photo-**
 alignment material for **liquid crystal** display device containing)
 IT ~~7631-86-9, Silica, uses~~
 RL: TEM (Technical or engineered material use); USES (Uses)
 (rubbing **alignment layer; photo-**
 alignment material for **liquid crystal** display device containing)

L56 ANSWER 3 OF 3 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1993:6454 HCAPLUS
 DN 118:6454
 TI Surface-aligned photoreaction of hydrobromic acid-d with ethene on platinum(111)
 AU Kiss, J.; Alberas, Diann J.; White, J. M.
 CS Dep. Chem. Biochem., Univ. Texas, Austin, TX, 78712, USA
 SO Journal of the American Chemical Society (1992), 114(26), 10486-92
 CODEN: JACSAT; ISSN: 0002-7863
 DT Journal
 LA English
 AB Evidence is presented for photon-driven production of ethane and bromoethane in the title reaction at 52 K. The formation of bromoethane is ascribed to a surface-aligned concerted reaction between photoexcited DBr-, or its vibrationally excited, electronically quenched form, and C2H4. This reaction is more likely when the C2H4 is adsorbed over a chemisorbed layer of DBr. Ethane is best accounted for by reaction of photogenerated energetic D atoms with C2H4 to form C2H4D, and hydrogenation of the latter during temperature-programmed desorption by active D atoms derived from dissociating DBr. When C2H4 and DBr are both in the first layer, the π -bonded form of **ethene reacts** more readily than the di- σ -bonded form.
 CC 22-4 (Physical Organic Chemistry)
 ST **ethene photoreaction** hydrobromic acid platinum mechanism
 IT Adsorption
 (of ethene and hydrobromic acid-d on platinum)
 IT Reduction, **photochemical**
 (of **ethene** by hydrobromic acid-d on platinum, mechanism of)
 IT Hydrobromination
 (**photochem.**, of **ethene** on platinum, mechanism of)
 IT 7440-06-4, Platinum, uses
 RL: CAT (Catalyst use); USES (Uses)
 (catalysts, for **photoreaction** of **ethene** with

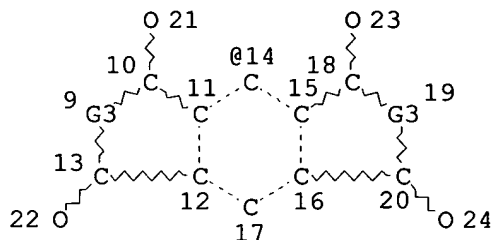
hydrobromic acid-d)
 IT 10035-10-6
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (hydrobromination, **photochem.**, of **ethene** on
 platinum, mechanism of)
 IT 13536-59-9, Hydrobromic acid-d
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (**photoreaction** of, with **ethene** on platinum,
 mechanism of)
 IT 74-85-1, **Ethene, reactions**
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (**photoreaction** of, with hydrobromic acid-d on platinum,
 mechanism of)

=> => D QUE L48

L14

STR 2

G1~C≡O Cb~G2~Cb Cb~Cb Ak—O G4 27
 3 @1 2 @4 5 6 @7 8 @25 26



VAR G1=NH/O/AK

VAR G2=C/O

VAR G3=O/N

VAR G4=1/4/25/14/7

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

GGCAT IS UNS AT 4

GGCAT IS UNS AT 6

GGCAT IS UNS AT 7

GGCAT IS UNS AT 8

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 27

STEREO ATTRIBUTES: NONE

L21 2147 SEA FILE=HCAPLUS ABB=ON PHOTO?(2A)?ALIGN?

L22 158890 SEA FILE=HCAPLUS ABB=ON LIQ?(2A)?CRYST?

L24 14183 SEA FILE=HCAPLUS ABB=ON L22(5A)?LAYER?

L25 16087 SEA FILE=HCAPLUS ABB=ON L21 OR L24

L26 SEL L25 1- RN : 21421 TERMS

L27 21420 SEA FILE=REGISTRY ABB=ON L26

L28 STR /

C≡C

1 2

NODE ATTRIBUTES:

NSPEC IS RC AT 1
 NSPEC IS RC AT 2
 DEFAULT MLEVEL IS ATOM
 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED
 NUMBER OF NODES IS 2

STEREO ATTRIBUTES: NONE

L29 SCR 2043
 L33 2866 SEA FILE=REGISTRY SUB=L27 SSS FUL L28 AND L14 AND L29
 L34 282341 SEA FILE=HCAPLUS ABB=ON L33
 L35 350 SEA FILE=HCAPLUS ABB=ON L21 AND L34
 L36 1702 SEA FILE=HCAPLUS ABB=ON L24 AND L34
 L37 103 SEA FILE=HCAPLUS ABB=ON L35 AND L36
 L38 85 SEA FILE=HCAPLUS ABB=ON L37 AND PHOTOG?/SC
 L39 47 SEA FILE=HCAPLUS ABB=ON L38 AND (DEVICE? OR DEV/RL)
 L40 23 SEA FILE=HCAPLUS ABB=ON L38 AND P/DT
 L44 22 SEA FILE=HCAPLUS ABB=ON L40 AND (1907-2002)/PRY,AY
 L45 62 SEA FILE=HCAPLUS ABB=ON L38 NOT L40
 L46 48 SEA FILE=HCAPLUS ABB=ON L45 NOT (2003-2005)/PY
 L47 70 SEA FILE=HCAPLUS ABB=ON L44 OR L46
 L48 40 SEA FILE=HCAPLUS ABB=ON L39 AND L47

*2. 866 structures
 from query*

limited to 1907-2002

=> D L48 BIB ABS HITIND HITSTR 1-40

L48 ANSWER 1 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2004:36758 HCAPLUS
 DN 140:67736
 TI Nematic **liquid crystal** compensator with barrier
layer and manufacturing process
 IN Bauer, Charles L.; Carroll-Lee, Ann L.; Castle, Richard A.; Elman, James
 F.; Hoff, Joseph W.; Houghtaling, Bradley M.; Nair, Mridula.; Payne, Jason
 A.; Shukla, Deepak.; Teegarden, David M.; Trest, Jeffrey A.
 PA Eastman Kodak Company, USA
 SO Eur. Pat. Appl., 15 pp.
 CODEN: EPXXDW
 DT **Patent**
 LA English
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1380877	A1	20040114	EP 2003-76911	20030619 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
	US 2004008303	A1	20040115	US 2002-194130	20020712 <--
	JP 2004062186	A2	20040226	JP 2003-196431	20030714 <--
	CN 1479143	A	20040303	CN 2003-147608	20030714 <--
PRAI	US 2002-194130	A	20020712	<--	

AB Disclosed is an optical compensator for a liquid crystal display comprising a transparent polymer support, a **photo-alignment** layer, an anisotropic **layer** comprising a nematic **liquid crystal**, and located between the support and the **photo-alignment** layer, an impermeable barrier layer. The invention also provides a process for making such compensators.

IC ICM G02F001-1336
ICS G02B005-30; G02F001-1337

CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)
Section cross-reference(s): 73, 75

ST nematic **liq crystal** compensator impermeable barrier
layer display manuf

IT Gelatins, uses
RL: **DEV (Device component use); USES (Uses)**
(barrier **layer**; nematic **liquid crystal** compensator with barrier **layer** and manufacturing process for improving viewing angle characteristics of liquid crystal display)

IT Liquid **crystal** displays
(nematic **liquid crystal** compensator with barrier **layer** and manufacturing process for improving viewing angle characteristics of liquid crystal display)

IT Liquid **crystals**
(nematic; nematic **liquid crystal** compensator with barrier **layer** and manufacturing process for improving viewing angle characteristics of liquid crystal display)

IT Optical instruments
(retarders; nematic **liquid crystal** compensator with barrier **layer** and manufacturing process for improving viewing angle characteristics of liquid crystal display)

IT 9002-89-5, Poly(vinyl alcohol) 9003-05-8D, Polyacrylamide, carboxyl modified 25951-87-5, Butyl methacrylate-glycidyl methacrylate copolymer 110389-14-5, Aminoethyl methacrylate hydrochloride-butyl acrylate-hydroxyethyl methacrylate copolymer
RL: **DEV (Device component use); USES (Uses)**
(barrier **layer**; nematic **liquid crystal** compensator with barrier **layer** and manufacturing process for improving viewing angle characteristics of liquid crystal display)

IT 543706-54-3, LCP-CB 483MEK
RL: **DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)**
(nematic **liquid crystal** compensator with barrier **layer** and manufacturing process for improving viewing angle characteristics of liquid crystal display)

IT 9002-89-5, Poly(vinyl alcohol) 9003-05-8D, Polyacrylamide, carboxyl modified 25951-87-5, Butyl methacrylate-glycidyl methacrylate copolymer 110389-14-5, Aminoethyl methacrylate hydrochloride-butyl acrylate-hydroxyethyl methacrylate copolymer
RL: **DEV (Device component use); USES (Uses)**
(barrier **layer**; nematic **liquid crystal** compensator with barrier **layer** and manufacturing process for improving viewing angle characteristics of liquid crystal display)

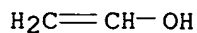
RN 9002-89-5 HCAPLUS

CN Ethenol, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 557-75-5

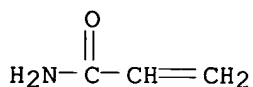
CMF C2 H4 O



RN 9003-05-8 HCAPLUS
 CN 2-Propenamide, homopolymer (9CI) (CA INDEX NAME)

CM 1

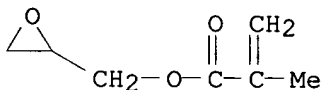
CRN 79-06-1
 CMF C3 H5 N O



RN 25951-87-5 HCAPLUS
 CN 2-Propenoic acid, 2-methyl-, butyl ester, polymer with oxiranylmethyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

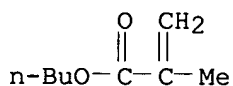
CM 1

CRN 106-91-2
 CMF C7 H10 O3



CM 2

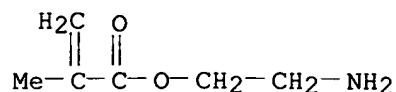
CRN 97-88-1
 CMF C8 H14 O2



RN 110389-14-5 HCAPLUS
 CN 2-Propenoic acid, 2-methyl-, 2-hydroxyethyl ester, polymer with 2-aminoethyl 2-methyl-2-propenoate hydrochloride and butyl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 2420-94-2
 CMF C6 H11 N O2 . Cl H

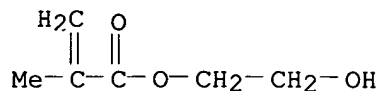


● HCl

CM 2

CRN 868-77-9

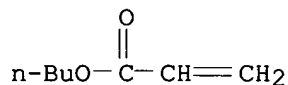
CMF C6 H10 O3



CM 3

CRN 141-32-2

CMF C7 H12 O2



RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L48 ANSWER 2 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2003:168905 HCAPLUS

DN 138:196023

TI In-plane switching mode liquid crystal display **device** with high aperture ratio

IN Seo, Seong Moh

PA LG Philips Lcd Co., Ltd., S. Korea

SO U.S., 10 pp., Division of U.S. Ser. No. 79,894.

CODEN: USXXAM

DT **Patent**

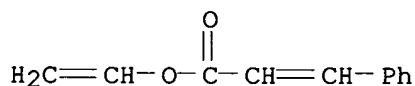
LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6529256	B1	20030304	US 2000-645332	20000825 <--
PRAI	KR 1997-19200	A	19970519	<--	
	US 1998-79894	A3	19980515	<--	
AB	An in-plane switching mode liquid crystal display device includes first and second substrates. A plurality of gate and data bus lines define pixel regions and arranged on the first substrate. A plurality of thin film transistors are adjacent resp. cross points of the gate and data				

bus lines. A plurality of gate electrodes are connected to said gate bus lines. A gate insulator is on the gate electrodes and a first metal layer includes a plurality of first electrodes on the gate insulator. A passivation layer is on the first metal layer. A transparent second metal layer includes a plurality of second electrodes on the passivation layer, the first and second electrodes applying plane elec. fields.

IC ICM G02F001-1343
 NCL 349141000; 349042000; 349043000; 349044000
 CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)
 IT Polyimides, uses
 RL: **DEV (Device component use); USES (Uses)**
 (alignment **layer**; in-plane switching mode **liquid crystal** display with high aperture ratio)
 IT Polysiloxanes, uses
 RL: **DEV (Device component use); USES (Uses)**
 (cinnamate, **photosensitive** second **alignment layer**; in-plane switching mode **liquid crystal** display with high aperture ratio)
 IT 50926-11-9, ITO
 RL: **DEV (Device component use); USES (Uses)**
 (in-plane switching mode liquid crystal display with high aperture ratio)
 IT **24968-99-8**, Poly(vinyl cinnamate)
 RL: **DEV (Device component use); USES (Uses)**
 (**photosensitive** second **alignment layer**; in-plane switching mode **liquid crystal** display with high aperture ratio)
 IT **24968-99-8**, Poly(vinyl cinnamate)
 RL: **DEV (Device component use); USES (Uses)**
 (**photosensitive** second **alignment layer**; in-plane switching mode **liquid crystal** display with high aperture ratio)
 RN 24968-99-8 HCAPLUS
 CN 2-Propenoic acid, 3-phenyl-, ethenyl ester, homopolymer (9CI) (CA INDEX NAME)
 CM 1
 CRN 3098-92-8
 CMF C11 H10 O2



RE.CNT 82 THERE ARE 82 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L48 ANSWER 3 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2002:908073 HCAPLUS
 DN 138:160993
 TI Control of pre-tilt angles of liquid crystal molecules using a chemically adsorbed monomolecular **layer** as an alignment film in **liquid crystal** cells
 AU Ogawa, Kazufumi; Ohtake, Tadashi; Nomura, Takaiki
 CS Department of Advanced Materials Science, Faculty of Engineering, Kagawa University, Kagawa, 761-0396, Japan

- SO Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers (2002), 41(11A), 6471-6477
CODEN: JAPNDE
- PB Japan Society of Applied Physics
- DT Journal
- LA English
- AB Photoaligned monomol. layers containing two materials were formed to control pre-tilt angles (θ_p) of liquid crystal mols. for twisted nematic (TN) type liquid crystal displays (LCDs) by a chemical adsorption (CA) technique and a photoalignment technique. One was a new chlorosilane type surfactant, 4'-(6-trichlorosilyloxyhexyloxy)chalcone (CO), having photopolymerizability, and the other was a surfactant having a straight carbon chain (SC). Although the authors tried screening six different surfactants as an additive to CO, a surfactant having a long straight hydrocarbon chain (octadecyltrichlorosilane: C18) was the most suitable for the TN type LCDs. By changing the mol. ratio of CO and C18, pre-tilt angles of liquid crystal mols. in a test liquid crystal (LC) cell could be controlled from 0 to 8° with perfect mono-domain alignment. When surfactants having short hydrocarbon chains and those having fluorocarbon chains were used, the quality of the TN type LC cells obtained was not good.
- CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)
- IT Interfacial energy
Liquid crystal displays
(**photoaligned** monomol. **alignment layer**
based on chlorosilane surfactants for control of pretilt angles of liquid crystal mols. in displays)
- IT Crosslinking
(**photochem.**; preparation and **photoalignment** of mixed monomol. layers containing photopolymerizable chlorosilane surfactant for alignment and control of pretilt angles of liquid crystal mols. in displays)
- IT Molecular orientation
(**photoinduced**; preparation and **photoalignment** of mixed monomol. layers containing photopolymerizable chlorosilane surfactant for alignment and control of pretilt angles of liquid crystal mols. in displays)
- IT Polymerization
(**photopolymer.**; preparation and **photoalignment** of mixed monomol. layers containing photopolymerizable chlorosilane surfactant for alignment and control of pretilt angles of liquid crystal mols. in displays)
- IT 18282-10-5, Tin dioxide 50926-11-9, ITO
RL: **DEV (Device component use)**; USES (Uses)
(monomol. layers containing two chlorosilane surfactants prepared by chemical adsorption and photoalignment for control of pretilt angles of liquid crystals in displays)
- IT 318951-26-7, MT-5087LA 496805-37-9, MLC 12000
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(**photoaligned** monomol. **alignment layer** based on chlorosilane surfactants for control of pretilt angles of liquid crystal mols. in displays)
- IT 112-04-9, Octadecyltrichlorosilane 141-57-1, Propyltrichlorosilane 592-09-6 871-41-0, Heptyltrichlorosilane 18402-22-7, Tetradecyltrichlorosilane 164081-94-1, Nonafluorohexyltrichlorosilane 302342-94-5

RL: DEV (Device component use); PRP (Properties); USES (Uses)
(photoaligned monomol. alignment layer based on
chlorosilane surfactants for control of pretilt angles of liquid crystal
mols. in displays)

IT 302342-94-5

RL: DEV (Device component use); PRP (Properties); USES (Uses)
(photoaligned monomol. alignment layer based on
chlorosilane surfactants for control of pretilt angles of liquid crystal
mols. in displays)

RN 302342-94-5 HCAPLUS

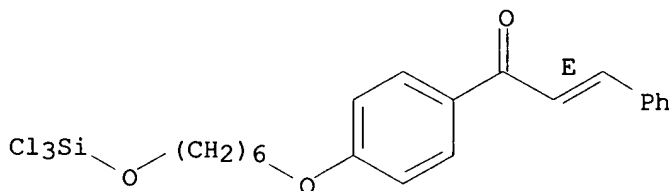
CN 2-Propen-1-one, 3-phenyl-1-[4-[[6-[(trichlorosilyl)oxy]hexyl]oxy]phenyl]-,
(2E)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 220202-83-5

CMF C21 H23 Cl3 O3 Si

Double bond geometry as shown.



RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L48 ANSWER 4 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2002:632129 HCAPLUS

DN 137:343828

TI Brownian ratchets and the photoalignment of liquid crystals

AU Palffy-Muhoray, P.; Kosa, T.; E., Weinan

CS Liquid Crystal Institute, Kent State University, Kent, OH, 44242, USA

SO Brazilian Journal of Physics (2002), 32(2B), 552-563

CODEN: BJPHE6; ISSN: 0103-9733

PB Sociedade Brasileira de Fisica

DT Journal

LA English

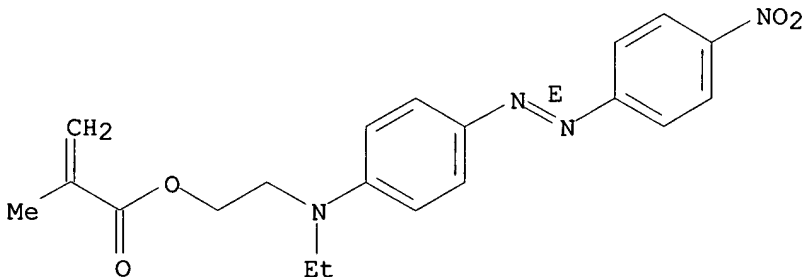
AB Mol. motors play key roles in areas ranging from biol. transport to emerging nanotechnol. They produce current as a result of transfer of energy but not of momentum from a source; many mol. motor scenarios are based on the translational Brownian ratchet mechanism. The authors consider the mechanism of photoalignment of liquid crystals both in the bulk and at the surface by a **photosensitive alignment** layer. The authors show that the photoalignment is due to an orientational ratchet mechanism, where the azo-dye mols., functionalized into a polymer alignment layer, when irradiated by polarized light act as the rotors of Brownian motors which reorient the bulk liquid crystal against an elastic restoring torque. Results of this photoalignment experiment can be obtained directly from a remote experiment set up at the Liquid Crystal Institute, via the WWW. In addition to exptl. results, the authors present a detailed Fokker-Planck description of this system. The authors discuss the implementation and the results of numerical simulations, and compare these with the exptl. observed dynamics.

CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and
Other Reprographic Processes)
ST Brownian ratchet photoalignment liq crystal; azo dye polymer alignment
layer liq crystal photoalignment
IT **151839-91-7**
RL: **DEV (Device component use)**; PEP (Physical, engineering or
chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(alignment layer; orientational ratchet mechanism of photoalignment of
liquid crystals by azo-dye substituted polymer alignment layer)
IT 40817-08-1, 5CB
RL: **DEV (Device component use)**; PEP (Physical, engineering or
chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(orientational ratchet mechanism of photoalignment of liquid crystals by
azo-dye substituted polymer alignment layer)
IT **151839-91-7**
RL: **DEV (Device component use)**; PEP (Physical, engineering or
chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(alignment layer; orientational ratchet mechanism of photoalignment of
liquid crystals by azo-dye substituted polymer alignment layer)
RN 151839-91-7 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, 2-[ethyl[4-[(1E)-(4-
nitrophenyl)azo]phenyl]amino]ethyl ester, polymer with methyl
2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

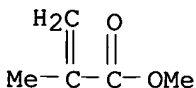
CRN 135161-28-3
CMF C20 H22 N4 O4

Double bond geometry as shown.



CM 2

CRN 80-62-6
CMF C5 H8 O2



RE.CNT 40 THERE ARE 40 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L48 ANSWER 5 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN

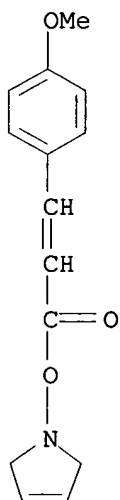
KATHLEEN FULLER EIC 1700 REMSEN 4B28 571/272-2505

AN 2002:554416 HCAPLUS
 DN 137:270341
 TI High contrast ratio of a vertically aligned liquid crystal cell using
photocrosslinking alignment
 AU Kim, Hyun-Wuk; Choi, Kyung-Soo; Kim, Jin-Yool; Kim, Tae-Min; Kim, Jong-Duk
 CS Department of Chemical Engineering, Korea Advanced Institute of Science
 and Technology, Daejeon, 305-701, S. Korea
 SO Liquid Crystals (2002), 29(6), 843-848
 CODEN: LICRE6; ISSN: 0267-8292
 PB Taylor & Francis Ltd.
 DT Journal
 LA English
 AB A **photoinduced alignment layer** for
liquid crystal displays (LCDs) has been successfully
 fabricated using the polarized UV induced photoreaction of a
 photocrosslinkable polymer with the incident UV light at some angle with
 respect to the cell normal. The surface alignment and electrooptic
 properties were investigated for various UV exposure times. The
 homeotropic alignment layer showed a discrete anisotropic dichroic ratio,
 its surface morphol. became smoother as the UV exposure time increased,
 and the LCs were arranged in a perpendicular direction to the polarized UV
 light direction with a proper pretilt angle. The cell showed no defects
 under cross-polarized microscopy and the contrast ratio was as high as
 550:1 in transmittance. The contrast ratio pattern was found to be very
 similar to that of dichroic ratio as a function of UV exposure time and
 depended upon the frequency change to some degree. The response time was
 also investigated.
 CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and
 Other Reprographic Processes)
 ST high contrast ratio vertically aligned liq crystal display
 photocrosslinking; **photoinduced alignment**
photocrosslinking polymer cinnamoyl pendant polarized light LCD
 IT Crosslinking
 (photochem.; **photoinduced alignment**
layer for **liquid crystal** displays fabricated
 by photocrosslinking of polymer containing cinnamoyl pendants with
 polarized UV)
 IT Electrooptical effect
Liquid crystal displays
 (**photoinduced alignment layer** for
liquid crystal displays fabricated by photocrosslinking
 of polymer containing cinnamoyl pendants with polarized UV)
 IT Molecular orientation
 (**photoinduced; photoinduced alignment**
layer for **liquid crystal** displays fabricated
 by photocrosslinking of polymer containing cinnamoyl pendants with
 polarized UV)
 IT **461664-08-4D**, alkyl derivs.
 RL: CPS (Chemical process); **DEV (Device component use)**; PEP
 (Physical, engineering or chemical process); PYP (Physical process); PROC
 (Process); USES (Uses)
 (**alignment layer; photoinduced**
alignment layer for **liquid crystal**
 displays fabricated by photocrosslinking of polymer containing cinnamoyl
 pendants with polarized UV)
 IT 452282-07-4, MLC-6610
 RL: **DEV (Device component use)**; PEP (Physical, engineering or
 chemical process); PYP (Physical process); PROC (Process); USES (Uses)
 (**photoinduced alignment layer** for

liquid crystal displays fabricated by photocrosslinking
of polymer containing cinnamoyl pendants with polarized UV)
IT 461664-08-4D, alkyl derivs.
RL: CPS (Chemical process); DEV (Device component use); PEP
(Physical, engineering or chemical process); PYP (Physical process); PROC
(Process); USES (Uses)
(alignment layer; photoinduced
alignment layer for liquid crystal
displays fabricated by photocrosslinking of polymer containing cinnamoyl
pendants with polarized UV)
RN 461664-08-4 HCAPLUS
CN 1H-Pyrrole, 2,5-dihydro-1-[[3-(4-methoxyphenyl)-1-oxo-2-propenyl]oxy]-,
homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 461664-07-3
CMF C14 H15 N O3

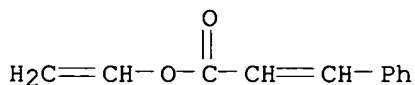


RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L48 ANSWER 6 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2002:488025 HCAPLUS
DN 137:39454
TI Manufacturing method of cholesteric liquid crystal color filter for liquid
crystal display
IN Ahn, Ji-Young; Moon, Jong-Weon
PA LG Philips LCD Co., Ltd., S. Korea
SO U.S. Pat. Appl. Publ., 7 pp.
CODEN: USXXCO
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
PI	US 2002080324	A1	20020627	US 2001-25766	20011226 <--
	US 6690439	B2	20040210		

KR 2002052252 A 20020704 KR 2000-81491 20001226 <--
 PRAI KR 2000-81491 A 20001226 <--
 AB The invention relates to a method of manufacturing cholesteric liquid crystal (CLC) color filters in which an alignment treatment is accomplished simultaneously with a coloring process during a light exposure process using UV ray. Photochromic CLC is used for the cholesteric liquid crystal (CLC) and a **photosensitive alignment** material is used for an alignment layer.
 IC ICM G02F001-1335
 NCL 349187000
 CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)
 Section cross-reference(s): 73, 75
 IT Polysiloxanes, uses
 RL: **DEV (Device component use); USES (Uses)**
 (cinnamate, alignment **layer**; manufacturing method of cholesteric **liquid crystal** color filter for liquid crystal display)
 IT **24968-99-8**, Polyvinyl cinnamate **76415-99-1**, Cellulose cinnamate
 RL: **DEV (Device component use); USES (Uses)**
 (alignment **layer**; manufacturing method of cholesteric **liq . crystal** color filter for liquid crystal display)
 IT **24968-99-8**, Polyvinyl cinnamate **76415-99-1**, Cellulose cinnamate
 RL: **DEV (Device component use); USES (Uses)**
 (alignment **layer**; manufacturing method of cholesteric **liq . crystal** color filter for liquid crystal display)
 RN 24968-99-8 HCAPLUS
 CN 2-Propenoic acid, 3-phenyl-, ethenyl ester, homopolymer (9CI) (CA INDEX NAME)
 CM 1
 CRN 3098-92-8
 CMF C11 H10 O2



RN 76415-99-1 HCAPLUS
 CN Cellulose, 3-phenyl-2-propenoate (9CI) (CA INDEX NAME)
 CM 1
 CRN 9004-34-6
 CMF Unspecified
 CCI PMS, MAN

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CM 2
 CRN 621-82-9
 CMF C9 H8 O2

Ph-CH=CH-CO₂H

L48 ANSWER 7 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2002:327034 HCAPLUS
 DN 137:54527
 TI In-plane photoalignment of **liquid crystals** by
 azobenzene-polyelectrolyte **layer-by-layer** ultrathin
 films
 AU Park, Mi-Kyoung; Advincula, Rigoberto C.
 CS Department of Chemistry, University of Alabama at Birmingham, Birmingham,
 AL, 35294-1240, USA
 SO Langmuir (2002), 18(11), 4532-4535
 CODEN: LANGD5; ISSN: 0743-7463
 PB American Chemical Society
 DT Journal
 LA English
 AB The authors demonstrated the utility of PAZO/PDADMAC layer-by-layer (LBL)
 films for controlling azimuthal alignment of liquid crystals (PAZO =
 poly{1-[4-(3-carboxy-4-hydroxyphenylazo)benzenesulfonamido]-1,2-
 ethanediyl, sodium salt}; PDADMAC = poly(diallyldimethylammonium
 chloride)). Irradiation of a hybrid liquid crystal (LC) cell with linearly
 polarized light resulted in in-plane homogeneous LC alignment, which is
 dependent on the thickness, irradiation time, orientation, and stability of
 the films. The director of the LC mols. was found to be perpendicular to
 the polarization plane θ and can be reoriented. In the future, it
 will be interesting to focus on any unique mechanism of photoalignment for
 this type of films. The parameters for LBL film preparation and
 polyelectrolyte design can be optimized for the photoalignment process and
 even allow patterning.
 CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and
 Other Reprographic Processes)
 Section cross-reference(s): 73
 ST liq crystal azimuthal **photoalignment photochromic**
 azobenzene polyelectrolyte ultrathin film
 IT Adsorbed **monolayers**
 (Langmuir-Blodgett; azimuthal photoalignment of **liquid**
crystals in hybrid cell containing ultrathin **layer**
-by-layer films of azobenzene-containing polyelectrolyte on one substrate
 and Langmuir Blodgett stearic acid monolayer on another substrate)
 IT Polyelectrolytes
 (**alignment layer**; azimuthal **photoalignment**
 of **liquid crystals** by ultrathin **layer-by-**
layer deposited films of azobenzene-containing polyelectrolyte)
 IT Optical transmission
Photochromic materials
 Polarized light
 (azimuthal **photoalignment of liquid crystals**
 by ultrathin **layer-by-layer** deposited films of
 azobenzene-containing polyelectrolyte)
 IT Electrooptical instruments
 Liquid crystal displays
 (azimuthal photoalignment of **liquid crystals** by
 ultrathin **layer-by-layer** deposited films of
 azobenzene-containing polyelectrolyte in relation to)
 IT Isomerization
 Isomerization kinetics
 (cis-trans, **photochem.**; azimuthal **photoalignment of**

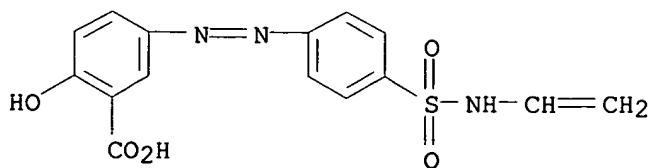
- liquid crystals** by ultrathin **layer-by-layer** deposited films of azobenzene-containing polyelectrolyte)
- IT Molecular orientation
(photoinduced; azimuthal **photoalignment** of **liquid crystals** by ultrathin **layer-by-layer** deposited films of azobenzene-containing polyelectrolyte)
- IT 26062-79-3, Poly(diallyldimethylammonium chloride) **89875-89-8**, Poly{[1-[4-(3-carboxy-4-hydroxyphenylazo)benzenesulfonamido]-1,2-ethanediyl, sodium salt}
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(**alignment layer**; azimuthal **photoalignment** of **liquid crystals** by ultrathin **layer-by-layer** deposited films of azobenzene-containing polyelectrolyte)
- IT 40817-08-1, 5CB
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(azimuthal photoalignment of **liquid crystals** by ultrathin **layer-by-layer** deposited films of azobenzene-containing polyelectrolyte)
- IT 57-11-4, Stearic acid, uses
RL: **DEV (Device component use)**; USES (Uses)
(azimuthal photoalignment of **liquid crystals** in hybrid cell containing ultrathin **layer-by-layer** films of azobenzene-containing polyelectrolyte on one substrate and Langmuir Blodgett stearic acid monolayer on another substrate)
- IT **89875-89-8**, Poly{[1-[4-(3-carboxy-4-hydroxyphenylazo)benzenesulfonamido]-1,2-ethanediyl, sodium salt}
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(**alignment layer**; azimuthal **photoalignment** of **liquid crystals** by ultrathin **layer-by-layer** deposited films of azobenzene-containing polyelectrolyte)
- RN 89875-89-8 HCAPLUS
- CN Benzoic acid, 5-[[4-[(ethenylamino)sulfonyl]phenyl]azo]-2-hydroxy-, homopolymer, sodium salt (9CI) (CA INDEX NAME)

CM 1

CRN 89875-88-7
CMF (C15 H13 N3 O5 S)x
CCI PMS

CM 2

CRN 89875-87-6
CMF C15 H13 N3 O5 S



RE.CNT 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L48 ANSWER 8 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2002:262001 HCAPLUS
DN 137:54523
TI Electrooptical characteristics of **photoaligned** vertical-
alignment cells on **photocrosslinkable** copolymer surfaces
containing the cholesteryl moiety
AU Hwang, Jeoung-Yeon; Seo, Dae-Shik; Hahn, Eun-Joo
CS Dept. of Electrical & Electronic Engineering (A-226), College of
Engineering, Yonsei University, Seoul, 120-749, S. Korea
SO Liquid Crystals (2002), 29(4), 567-572
CODEN: LICRE6; ISSN: 0267-8292
PB Taylor & Francis Ltd.
DT Journal
LA English
AB The electrooptical (EO) performance was studied of a **photoaligned**
vertical-**alignment** liquid crystal display (VA-LCD) on
poly(4-methacryloyloxychalcone-cholesteryl methacrylate) surface.
Thermogravimetric anal. showed good thermal stability of the synthesized
photocrosslinkable copolymer. A good voltage-transmittance curve and fast
response time were observed in the photoaligned VA-LCD with obliquely
polarized UV exposure at 30° of the copolymer surface. The EO
characteristics of the photoaligned VA-LCD decreased after long time UV
exposure because of dissociation of the ester linkage in the chalcone
structure of the photocrosslinkable polymer.
CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and
Other Reprographic Processes)
Section cross-reference(s): 73, 75
ST electrooptical characteristics liq crystal display vertical
alignment photocrosslinkable polymer; polarized UV
photoalignment liq crystal methacryloyloxychalcone cholesteryl
methacrylate polymer
IT Photolysis
(degradation of poly(methacryloyloxychalcone-cholesteryl methacrylate)
liquid crystal display alignment **layer** under
long UV exposure)
IT **362046-30-8**, Poly(4-methacryloyloxychalcone-cholesteryl
methacrylate)
RL: **DEV (Device component use)**; PEP (Physical, engineering or
chemical process); PRP (Properties); PYP (Physical process); PROC
(Process); USES (Uses)
(alignment layer; thermal stability of **photocrosslinking**
photoalignment layer and electrooptical
characteristics of **liquid crystal** display containing this
layer)
IT 393165-69-0, MJ951294
RL: **DEV (Device component use)**; PEP (Physical, engineering or
chemical process); PRP (Properties); PYP (Physical process); PROC
(Process); USES (Uses)
(electrooptical performance of liquid crystal display photoaligned with
polarized UV exposure of poly(methacryloyloxychalcone-cholesteryl
methacrylate) alignment layer)
IT **362046-30-8**, Poly(4-methacryloyloxychalcone-cholesteryl
methacrylate)
RL: **DEV (Device component use)**; PEP (Physical, engineering or
chemical process); PRP (Properties); PYP (Physical process); PROC

(Process); USES (Uses)

(alignment layer; thermal stability of **photocrosslinking photoalignment layer** and electrooptical characteristics of **liquid crystal** display containing this **layer**)

RN 362046-30-8 HCAPLUS

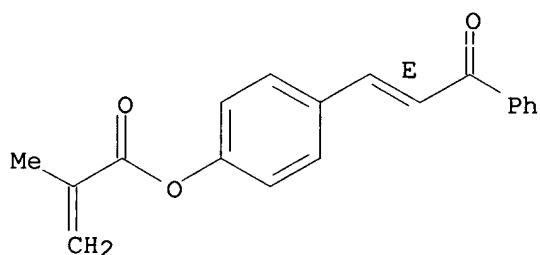
CN Cholest-5-en-3-ol (3 β)-, 2-methyl-2-propenoate, polymer with 4-[(1E)-3-oxo-3-phenyl-1-propenyl]phenyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 211301-72-3

CMF C19 H16 O3

Double bond geometry as shown.

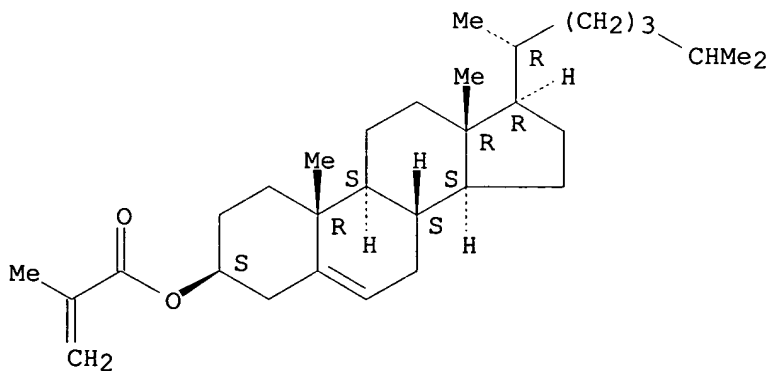


CM 2

CRN 35109-51-4

CMF C31 H50 O2

Absolute stereochemistry.



RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L48 ANSWER 9 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2002:256724 HCAPLUS

DN 136:270728

TI Liquid crystal display **device** and method for manufacturing the same

IN Nam, Mi Sook; Park, Su Hyun
 PA Lg Philips Lcd Co., Ltd., S. Korea
 SO U.S. Pat. Appl. Publ., 9 pp.
 CODEN: USXXCO

DT Patent
 LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002039160	A1	20020404	US 2001-968652	20011003 <--
	KR 2002027007	A	20020413	KR 2000-58149	20001004 <--
PRAI	KR 2000-58149	A	20001004	<--	

AB A liquid crystal display **device** includes a first substrate; a second substrate; a first alignment layer on the first substrate, the first alignment layer including a first additive; a second alignment layer on the second substrate; and a **liquid crystal layer** between the first substrate and the second substrate. The additive to the **photo-alignment** layer improves **photo**-stability and image sticking. The additive is selected from benzotriazoles, silanes, acrylates, and UV epoxies. The **photo-alignment** layer is made up of polyimides, polyamides, or polyamic acids.

IC ICM G02F001-1337

NCL 349123000

CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)

ST liq crystal display **device** manuf additive **photo alignment** layer

IT Acrylic polymers, uses

Epoxy resins, uses

Silanes

RL: MOA (Modifier or additive use); USES (Uses)

(additive to **photo-alignment layer**;

liquid crystal display **device** showing

improved photo-stability and image-sticking)

IT Liquid crystal displays

(liquid crystal display **device** and its manufacture)

IT Polyamic acids

Polyamides, uses

Polyimides, uses

RL: DEV (Device component use); USES (Uses)

(**photo-alignment layer**; **liquid**

crystal display **device** showing improved

photo-stability and image-sticking)

IT 95-14-7, 1H-Benzotriazole **28961-43-5**, SR 499

RL: MOA (Modifier or additive use); USES (Uses)

(additive to **photo-alignment layer**;

liquid crystal display **device** showing

improved photo-stability and image-sticking)

IT **28961-43-5**, SR 499

RL: MOA (Modifier or additive use); USES (Uses)

(additive to **photo-alignment layer**;

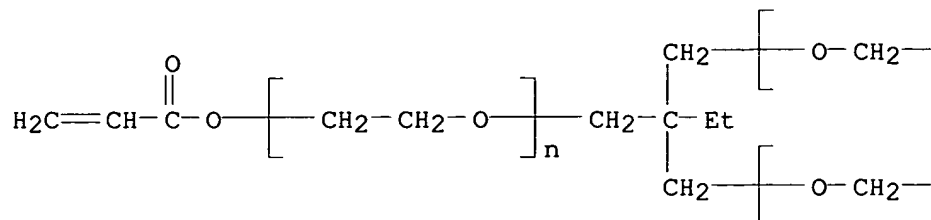
liquid crystal display **device** showing

improved photo-stability and image-sticking)

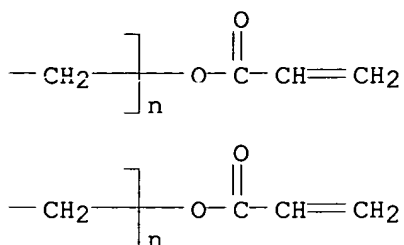
RN 28961-43-5 HCAPLUS

CN Poly(oxy-1,2-ethanediyl), α -hydro- ω -[(1-oxo-2-propenyl)oxy]-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol (3:1) (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



L48 ANSWER 10 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2002:47811 HCAPLUS

DN 136:110209

TI Color filter, its manufacture, and liquid crystal display **device**

IN Ichimura, Kunihiro; Arai, Masatoshi

PA Dai Nippon Printing Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DT **Patent**

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002014232	A2	20020118	JP 2000-197121	20000629 <--
PRAI	JP 2000-197121		20000629	<--	

AB The color filter comprises a substrate successively coated with (1) a photosensitive mol. layer whose surface alignment is controlled by irradiation of liner polarized light or skew nonpolarized light, (2) a dichroic dye layer whose alignment is controlled in contact with the mol. layer, and (3) a colored layer. The liquid crystal comprises the color filter, a substrate, a **liquid crystal layer**, and a polarizer. The color filter is manufactured by the steps of (1) coating the photosensitive mol. on a substrate, (2) irradiating the liner polarized light or skew nonpolarized light with wavelength for causing a photochem. reaction to control the surface alignment of the mol. layer, (3) coating the dichroic dye, and (4) forming a colored layer comprising red, green, and blue. As the color filter has polarizing function, thin and light liquid crystal display **device** using the color filter is manufactured at low cost.

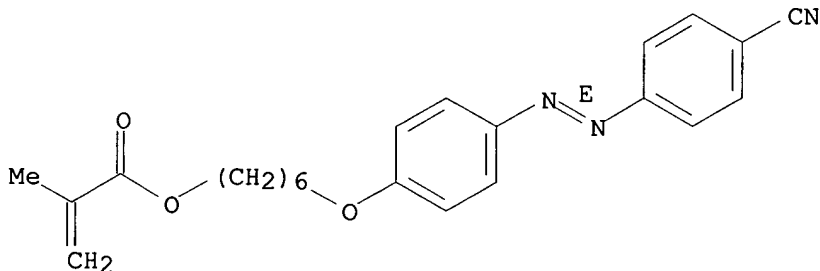
IC ICM G02B005-30

ICS B32B007-02; G02B005-20; G02F001-1335; G02F001-1337

CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and

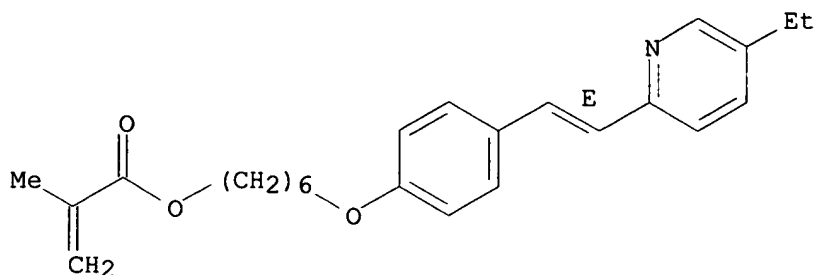
Other Reprographic Processes)
 ST color filter **photosensitive** mol layer **alignment**;
 dichroic dye layer color filter; liq crystal display color filter
 IT Liquid crystal displays
 Optical filters
 (color filter comprising **alignment**-controlled
photosensitive mol. layer and dichroic dye layer)
 IT Dyes
 (dichroic; color filter comprising **alignment**-controlled
photosensitive mol. layer and dichroic dye layer)
 IT 7219-11-6, C.I. Direct Green 59 25180-30-7, C.I. Direct Blue 67
168647-61-8 389626-10-2
 RL: DEV (Device component use); USES (Uses)
 (color filter comprising **alignment**-controlled
photosensitive mol. layer and dichroic dye layer)
 IT **168647-61-8 389626-10-2**
 RL: DEV (Device component use); USES (Uses)
 (color filter comprising **alignment**-controlled
photosensitive mol. layer and dichroic dye layer)
 RN 168647-61-8 HCAPLUS
 CN 2-Propenoic acid, 2-methyl-, 6-[4-[(4-cyanophenyl)azo]phenoxy]hexyl ester,
 (2E)-, homopolymer (9CI) (CA INDEX NAME)
 CM 1
 CRN 123924-76-5
 CMF C23 H25 N3 O3

Double bond geometry as shown.



RN 389626-10-2 HCAPLUS
 CN 2-Propenoic acid, 2-methyl-, 6-[4-[(1E)-2-(5-ethyl-2-pyridinyl)ethenyl]phenoxy]hexyl ester, homopolymer (9CI) (CA INDEX NAME)
 CM 1
 CRN 389626-09-9
 CMF C25 H31 N O3

Double bond geometry as shown.



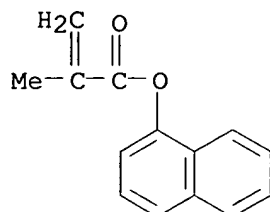
L48 ANSWER 11 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2001:815650 HCAPLUS
 DN 136:110064
 TI Naphthalene containing polymers as new photoaligning materials for LCs
 AU Syromyatnikov, V. G.; Vretik, L. O.; Yaroshchuk, O. V.; Zakrevskyy, Y. A.;
 Kim, T. M.; Jo, J. H.; Kim, J. Y.; Kim, S. H.
 CS Taras Shevchenko University, Kiev, 01033, Ukraine
 SO Molecular Crystals and Liquid Crystals Science and Technology, Section A:
 Molecular Crystals and Liquid Crystals (2001), 368, 543-549
 CODEN: MCLCE9; ISSN: 1058-725X
 PB Gordon & Breach Science Publishers
 DT Journal
 LA English
 AB Polynaphthylmethacrylates (PNMA) are considered as a new class of liquid
 crystal (LC) photoaligning polymers. The films of PNMA irradiated with
 polarized UV light provide high quality LC alignment with the easy axis
 oriented perpendicularly to polarization direction of the exciting light.
 A maximal value of the azimuthal anchoring energy was estimated as
 5×10^{-6} J/m². It is close to the best photoaligning materials.
 Fries rearrangement is considered as a main photochem. reaction leading to
 anisotropy of PNMA layers.
 CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and
 Other Reprographic Processes)
 ST naphthalene deriv side chain methacrylate polymer photoalignment liq
 crystal; alignment **layer liq crystal**
 photoreaction naphthyl methacrylate polymer; polynaphthyl methacrylate
photoinduced alignment liq crystal display
 IT 31547-85-0, 1-Naphthyl methacrylate homopolymer
 RL: CPS (Chemical process); **DEV (Device component use)**; PEP
 (Physical, engineering or chemical process); PRP (Properties); PYP
 (Physical process); PROC (Process); USES (Uses)
 (alignment layer; naphthyl methacrylate homopolymer as new
 photoaligning material for liquid crystals)
 IT 146104-43-0, MLC6012 148937-72-8, ZLI4801-000
 RL: **DEV (Device component use)**; PRP (Properties); USES (Uses)
 (naphthyl methacrylate homopolymer as new photoaligning material for
 liquid crystals)
 IT 31547-85-0, 1-Naphthyl methacrylate homopolymer
 RL: CPS (Chemical process); **DEV (Device component use)**; PEP
 (Physical, engineering or chemical process); PRP (Properties); PYP
 (Physical process); PROC (Process); USES (Uses)
 (alignment layer; naphthyl methacrylate homopolymer as new
 photoaligning material for liquid crystals)
 RN 31547-85-0 HCAPLUS
 CN 2-Propenoic acid, 2-methyl-, 1-naphthalenyl ester, homopolymer (9CI) (CA

INDEX NAME)

CM 1

CRN 19102-44-4

CMF C14 H12 O2



RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L48 ANSWER 12 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2001:760354 HCAPLUS
DN 135:311053
TI Manufacture of **liquid crystal alignment layers** by **photocrosslinking** and heat treatment
IN Nakata, Shoichi; Kumano, Atsushi; Takeuchi, Yasumasa
PA Agency of Industrial Sciences and Technology, Japan; Shin Energy Sangyo
Gijutsu Sogo Kaihatsu Kiko; JSR Ltd.
SO Jpn. Kokai Tokkyo Koho, 17 pp.
CODEN: JKXXAF

DT **Patent**
LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001290155	A2	20011019	JP 2000-107818	20000410 <--
PRAI	JP 2000-107818		20000410	<--	
AB	The layers are manufactured in high throughput by light exposure on photocrosslinkable polymer layers and heat treatment. The photocrosslinkable moieties of the polymers may be represented by P1CR1:CR2COQ1, P2CR3:CR4COQ2, and/or P3CR5:CR6COQ3 (P1, Q2 = monovalent aromatic group; Q1, P2, P3, Q3 = bivalent aromatic group; R1-6 = H, alkyl).				
IC	ICM G02F001-1337 ICS C08J007-00				
CC	74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes) Section cross-reference(s): 38				
ST	photocrosslinked heat stabilized liq crystal alignment layer ; chalconyloxyhexanoxystyrene copolymer liq crystal alignment layer				
IT	Liquid crystal displays (alignment layers ; manufacture of liquid crystal alignment layers by photocrosslinking and heat treatment)				
IT	Heat treatment (manufacture of liquid crystal alignment layers by photocrosslinking and heat treatment)				

IT Crosslinking
(photochem.; manufacture of **liquid crystal alignment layers** by **photocrosslinking** and heat treatment)

IT 300711-96-0P 300711-99-3P
RL: DEV (Device component use); IMF (Industrial manufacture);
PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process); USES (Uses)
(crosslinked, alignment **layers**; manufacture of **liquid crystal alignment layers** by **photocrosslinking** and heat treatment)

IT 367268-61-9P
RL: DEV (Device component use); IMF (Industrial manufacture);
PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process); USES (Uses)
(manufacture of **liquid crystal alignment layers** by **photocrosslinking** and heat treatment)

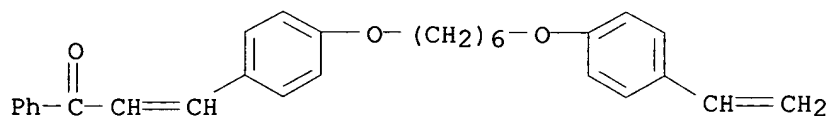
IT 300711-96-0P 300711-99-3P
RL: DEV (Device component use); IMF (Industrial manufacture);
PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process); USES (Uses)
(crosslinked, alignment **layers**; manufacture of **liquid crystal alignment layers** by **photocrosslinking** and heat treatment)

RN 300711-96-0 HCAPLUS
CN 1H-Pyrrole-2,5-dione, 1-phenyl-, polymer with 3-[4-[[6-(4-ethenylphenoxy)hexyl]oxy]phenyl]-1-phenyl-2-propen-1-one and 1-ethenyl-4-(trifluoromethyl)benzene (9CI) (CA INDEX NAME)

CM 1

CRN 300711-95-9

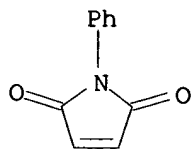
CMF C29 H30 O3



CM 2

CRN 941-69-5

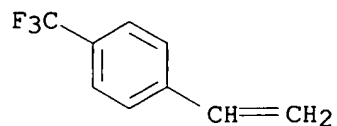
CMF C10 H7 N O2



CM 3

CRN 402-50-6

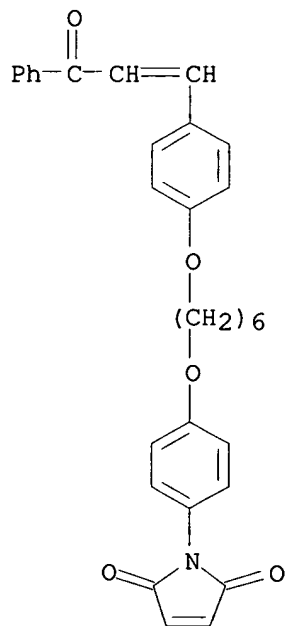
CMF C9 H7 F3



RN 300711-99-3 HCAPLUS
CN 1H-Pyrrole-2,5-dione, 1-[4-[[6-[4-(3-oxo-3-phenyl-1-propenyl)phenoxy]hexyl]oxy]phenyl]-, polymer with ethenylbenzene and 1-ethenyl-4-(trifluoromethyl)benzene (9CI) (CA INDEX NAME)

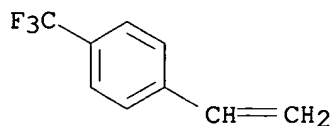
CM 1

CRN 300711-98-2
CMF C31 H29 N O5



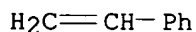
CM 2

CRN 402-50-6
CMF C9 H7 F3



CM 3

CRN 100-42-5
CMF C8 H8



IT 367268-61-9P

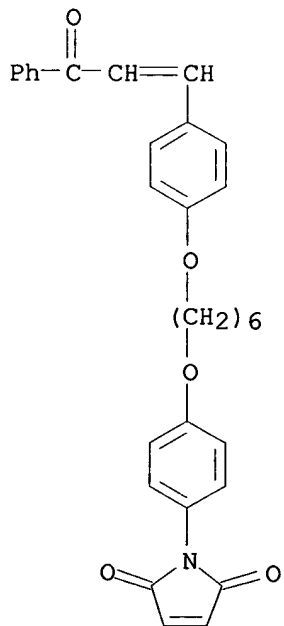
RL: **DEV (Device component use)**; IMF (Industrial manufacture);
PEP (Physical, engineering or chemical process); PREP (Preparation); PROC
(Process); USES (Uses)
(manufacture of **liquid crystal alignment**
layers by photocrosslinking and heat treatment)

RN 367268-61-9 HCAPLUS

CN 1H-Pyrrole-2,5-dione, 1-[4-[[6-[4-(3-oxo-3-phenyl-1-propenyl)phenoxy]hexyl]oxy]phenyl]-, polymer with 3-[4-[[6-(4-ethenylphenoxy)hexyl]oxy]phenyl]-1-phenyl-2-propen-1-one and 1-ethenyl-4-(trifluoromethyl)benzene (9CI) (CA INDEX NAME)

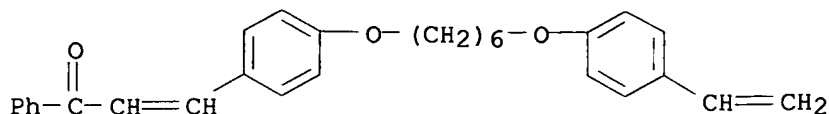
CM 1

CRN 300711-98-2
CMF C31 H29 N O5



CM 2

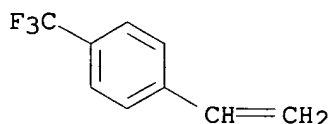
CRN 300711-95-9
CMF C29 H30 O3



CM 3

CRN 402-50-6

CMF C9 H7 F3



- L48 ANSWER 13 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2001:508700 HCAPLUS
 DN 135:264463
 TI Electrooptical characteristics for the **photoaligned** vertical **alignment** cell using **photopolymer** surfaces containing chalconyl and cholesteryl groups
 AU Hwang, Jeoung-Yeon; Seo, Dae-Shik
 CS Department of Electrical & Electronic Engineering, College of Engineering, Yonsei University, Seoul, 120-749, S. Korea
 SO Liquid Crystals (2001), 28(7), 1065-1069
 CODEN: LICRE6; ISSN: 0267-8292
 PB Taylor & Francis Ltd.
 DT Journal
 LA English
 AB A photoalignment film poly(4-methacryloyloxychalcone-cholesteryl methacrylate) (copoly(M4Ch-ChMA)) was synthesized for homeotropic alignment of liquid crystals. Electrooptical characteristics were determined for photoaligned vertical liquid crystal display (LCD) containing the above film. Excellent voltage-transmittance characteristics were achieved for the photoaligned VA-LCD with 1 min polarized UV exposure at an oblique direction of 30° on the copoly(M4Ch-ChMA) surfaces. The response time of the VA-LCD was about 39 ms, and increased with increasing UV exposure time. The authors suggest that the proportion of photodimerized chalcone group increased with increasing UV exposure time, contributing to a higher response time.
 CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)
 IT Electrooptical effect
 Liquid crystal displays
 (electrooptical characteristics of **liquid crystal** display using **photoalignment layer** from **photopolymer** containing chalconyl and cholesteryl groups)
 IT Molecular orientation
 (photoinduced; electrooptical characteristics of **liquid crystal** display using **photoalignment layer** from **photopolymer** containing chalconyl and cholesteryl groups)
 IT 362046-30-8P

RL: **DEV (Device component use)**; PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(electrooptical characteristics of **liquid crystal** display using **photoalignment layer** from **photopolymer** containing chalconyl and cholesteryl groups)

IT 35109-51-4P, Cholesteryl methacrylate 36452-05-8P, 4-Methacryloyloxychalcone

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(synthesis of photoalignment layer for **liquid crystal** displays)

IT **362046-30-8P**

RL: **DEV (Device component use)**; PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(electrooptical characteristics of **liquid crystal** display using **photoalignment layer** from **photopolymer** containing chalconyl and cholesteryl groups)

RN 362046-30-8 HCAPLUS

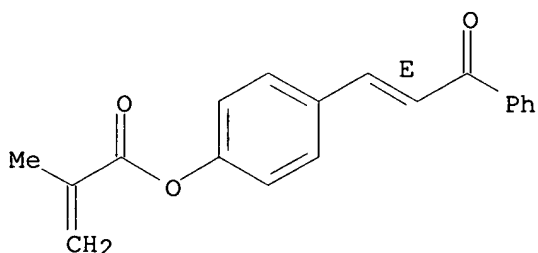
CN Cholest-5-en-3-ol (3 β)-, 2-methyl-2-propenoate, polymer with 4-[(1E)-3-oxo-3-phenyl-1-propenyl]phenyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 211301-72-3

CMF C19 H16 O3

Double bond geometry as shown.



CM 2

CRN 35109-51-4

CMF C31 H50 O2

Absolute stereochemistry.

Silanes

RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)

(manufacture of **liquid crystal** display substrates equipped with alignment **layers** by polarized UV irradiation of photosensitive compds. followed by heat polymerization or heat melting)

IT Molecular orientation

(photo-; manufacture of **liquid crystal** display substrates equipped with alignment **layers** by polarized UV irradiation of photosensitive compds. followed by heat polymerization or heat melting)

IT UV radiation

(polarized; manufacture of **liquid crystal** display substrates equipped with alignment **layers** by polarized UV irradiation of photosensitive compds. followed by heat polymerization or

heat

melting)

IT **332893-11-5P 332893-14-8P 332893-17-1P**

332893-20-6P

RL: **DEV (Device component use)**; PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(manufacture of **liquid crystal** display substrates equipped with alignment **layers** by polarized UV irradiation of photosensitive compds. followed by heat polymerization or heat melting)

IT 25036-53-7 25038-81-7

RL: **DEV (Device component use)**; TEM (Technical or engineered material use); USES (Uses)

(manufacture of **liquid crystal** display substrates equipped with alignment **layers** by polarized UV irradiation of photosensitive compds. followed by heat polymerization or heat melting)

IT **332893-11-5P 332893-14-8P 332893-17-1P**

332893-20-6P

RL: **DEV (Device component use)**; PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(manufacture of **liquid crystal** display substrates equipped with alignment **layers** by polarized UV irradiation of photosensitive compds. followed by heat polymerization or heat melting)

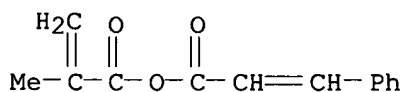
RN 332893-11-5 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, anhydride with 3-phenyl-2-propenoic acid, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 86220-06-6

CMF C13 H12 O3

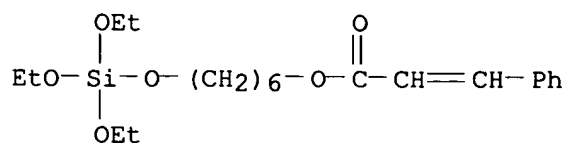


RN 332893-14-8 HCAPLUS

CN 2-Propenoic acid, 3-phenyl-, 6-[(triethoxysilyl)oxy]hexyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

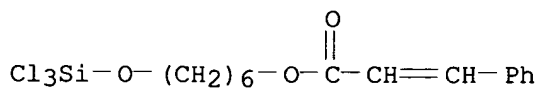
CRN 332893-13-7
CMF C21 H34 O6 Si



RN 332893-17-1 HCAPLUS
CN 2-Propenoic acid, 3-phenyl-, 6-[(trichlorosilyl)oxy]hexyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

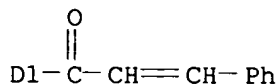
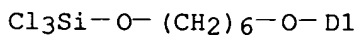
CRN 332893-16-0
CMF C15 H19 Cl3 O3 Si



RN 332893-20-6 HCAPLUS
CN 2-Propen-1-one, 3-phenyl-1-[[[6-[(trichlorosilyl)oxy]hexyl]oxy]phenyl]-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 332893-19-3
CMF C21 H23 Cl3 O3 Si
CCI IDS



L48 ANSWER 15 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2001:205293 HCAPLUS
DN 135:12017
TI Thermally stable photoalignment layer of a novel photocrosslinkable polymethacrylate for liquid crystal display
AU Kawatsuki, Nobuhiro; Takatsuka, Hirohumi; Yamamoto, Tohei

CS Department of Applied Chemistry, Himeji Institute of Technology, Himeji,
671-2201, Japan

SO Japanese Journal of Applied Physics, Part 2: Letters (2001), 40(3A),
L209-L211
CODEN: JAPLD8; ISSN: 0021-4922

PB Japan Society of Applied Physics

DT Journal

LA English

AB Photoreactions and thermal stability are studied of photoalignment layer
based on a polymethacrylate containing Me 4-(4'-hexyloxy)benzoyloxy-cinnamate
side group. The axis-selective photoreaction of the cinnamoyl group
induced a neg. dichroism, while the photo-Fries rearrangement caused a
small pos. one. The neg. dichroism became pos. when the film was annealed
at 150° as a result of self-organization of the side groups, and
the annealing treatment at 210° did not change its spectroscopic
characteristics. The nematic LC was aligned on the exposed films in a
direction parallel to the elec. vector of linearly polarized UV light and
the alignment layer showed thermal durability of the orientational
characteristics of the liquid crystal up to 200°.

CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and
Other Reprographic Processes)

ST **liq crystal display photoalignment**
layer photocrosslinkable polymethacrylate; cinnamate
side group **photocrosslinkable** polymethacrylate
photoalignment layer liq crystal

IT UV and visible spectra
(absorption; photoreactions and thermal stability of polymethacrylate
containing (hexyloxy)benzoyloxy-cinnamate side group and its application as
photoalignment **layer** for **liquid crystal**
displays)

IT Crosslinking
Fries rearrangement
(photochem.; photoreactions and thermal stability of polymethacrylate
containing (hexyloxy)benzoyloxy-cinnamate side group and its application as
photoalignment **layer** for **liquid crystal**
displays)

IT Absorption spectra
Thermal stability
(photoreactions and thermal stability of polymethacrylate containing
(hexyloxy)benzoyloxy-cinnamate side group and its application as
photoalignment **layer** for **liquid crystal**
displays)

IT UV radiation
(polarized; photoreactions and thermal stability of polymethacrylate
containing (hexyloxy)benzoyloxy-cinnamate side group and its application as
photoalignment **layer** for **liquid crystal**
displays)

IT Molecular orientation
Orientational order
(thermally stable **photoalignment layer** from
photocrosslinkable polymethacrylate for **liquid**
crystal displays)

IT **341548-51-4**
RL: **DEV (Device component use)**; PEP (Physical, engineering or
chemical process); PRP (Properties); PROC (Process); USES (Uses)
(PBM 6; photoreactions and thermal stability of polymethacrylate
containing (hexyloxy)benzoyloxy-cinnamate side group and its application as
photoalignment **layer** for **liquid crystal**
displays)

IT 58600-86-5, C15
 RL: MOA (Modifier or additive use); USES (Uses)
 (chiral dopant; thermally stable **photoalignment layer**
 from **photocrosslinkable** polymethacrylate for **liquid**
crystal displays)

IT 341971-46-8, DB 14
 RL: MOA (Modifier or additive use); USES (Uses)
 (dichroic dye; thermally stable **photoalignment layer**
 from **photocrosslinkable** polymethacrylate for **liquid**
crystal displays)

IT 146105-19-3, ZLI4792
 RL: **DEV (Device component use)**; USES (Uses)
 (thermally stable **photoalignment layer** from
photocrosslinkable polymethacrylate for **liquid**
crystal displays)

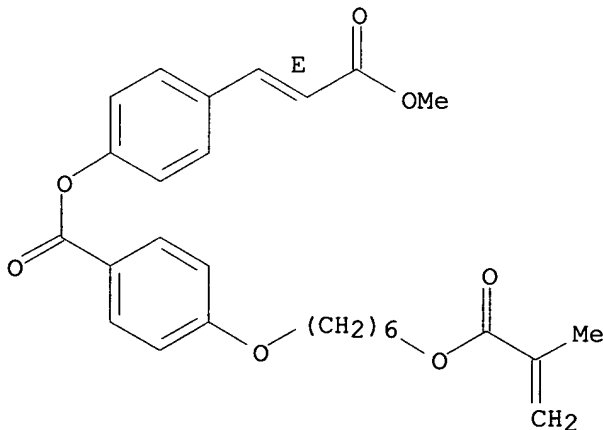
IT **341548-51-4**
 RL: **DEV (Device component use)**; PEP (Physical, engineering or
 chemical process); PRP (Properties); PROC (Process); USES (Uses)
 (P6MC 6; photoreactions and thermal stability of polymethacrylate
 containing (hexyloxy)benzoyloxycinnamate side group and its application as
 photoalignment **layer** for **liquid crystal**
 displays)

RN 341548-51-4 HCAPLUS
 CN Benzoic acid, 4-[[6-[(2-methyl-1-oxo-2-propenyl)oxy]hexyl]oxy]-,
 4-[(1E)-3-methoxy-3-oxo-1-propenyl]phenyl ester, homopolymer (9CI) (CA
 INDEX NAME)

CM 1

CRN 188956-78-7
 CMF C27 H30 O7

Double bond geometry as shown.



RE.CNT 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L48 ANSWER 16 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2001:124183 HCAPLUS
 DN 134:186041
 TI Manufacture of polymer alignment **layers** and **liquid-**

crystal displays containing them
 IN Murai, Hideya; Nakata, Daisaku; Goto, Tomohisa
 PA NEC Corp., Japan
 SO Jpn. Kokai Tokkyo Koho, 10 pp.
 CODEN: JKXXAF

DT **Patent**
 LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001048904	A2	20010220	JP 1999-228464	19990812 <--
	JP 3508918	B2	20040322		
PRAI	JP 1999-228464		19990812 <--		

AB The alignment layers are manufactured by irradiating monomers or oligomers with light anisotropically. The layers may be manufactured by applying solns. containing the monomers or oligomers and low-b.p. solvents on substrates, followed with anisotropic irradiation. Layers showing good alignment stability are obtained with high productivity without pretreatment by high-temperature heating.

IC ICM C08F002-46

ICS C08F036-02; G02F001-1337

CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)
 Section cross-reference(s): 35, 38

ST **liq crystal** display alignment layer

manuf **photopolymn**; anisotropic UV radiation LCD alignment layer

manuf; acrylic monomer oligomer anisotropic irradsn polymn LCD

IT **Liquid crystal** displays

(manufacture of polymer alignment **layers** by anisotropic light irradiation for LCD)

IT **28628-65-1P**, Neopentyl glycol diacrylate homopolymer

32535-62-9P 105356-24-9P, 4,4'-Bisacryloyloxybiphenyl

homopolymer **199930-19-3P 203300-68-9P**

326500-87-2P 326500-88-3P

RL: **DEV (Device component use)**; IMF (Industrial manufacture);

TEM (Technical or engineered material use); PREP (Preparation); USES

(Uses)

(manufacture of polymer alignment layers by anisotropic light irradiation

for

LCD)

IT **28628-65-1P**, Neopentyl glycol diacrylate homopolymer

32535-62-9P 105356-24-9P, 4,4'-Bisacryloyloxybiphenyl

homopolymer **199930-19-3P 203300-68-9P**

326500-87-2P 326500-88-3P

RL: **DEV (Device component use)**; IMF (Industrial manufacture);

TEM (Technical or engineered material use); PREP (Preparation); USES

(Uses)

(manufacture of polymer alignment layers by anisotropic light irradiation

for

LCD)

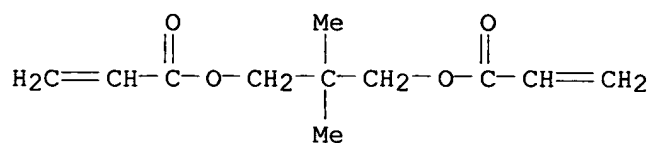
RN 28628-65-1 HCAPLUS

CN 2-Propenoic acid, 2,2-dimethyl-1,3-propanediyl ester, homopolymer (9CI)
 (CA INDEX NAME)

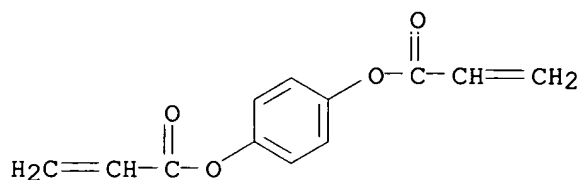
CM 1

CRN 2223-82-7

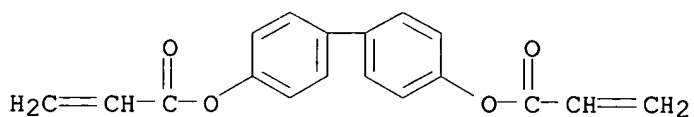
CMF C11 H16 O4



RN 32535-62-9 HCAPLUS
 CN 2-Propenoic acid, 1,4-phenylene ester, homopolymer (9CI) (CA INDEX NAME)
 CM 1
 CRN 6729-79-9
 CMF C12 H10 O4

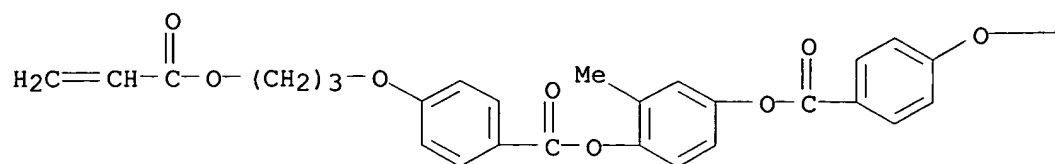


RN 105356-24-9 HCAPLUS
 CN 2-Propenoic acid, [1,1'-biphenyl]-4,4'-diyl ester, homopolymer (9CI) (CA INDEX NAME)
 CM 1
 CRN 84948-17-4
 CMF C18 H14 O4

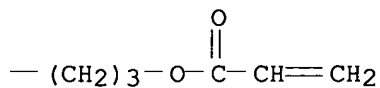


RN 199930-19-3 HCAPLUS
 CN Benzoic acid, 4-[3-[(1-oxo-2-propenyl)oxy]propoxy]-, 2-methyl-1,4-phenylene ester, homopolymer (9CI) (CA INDEX NAME)
 CM 1
 CRN 174063-87-7
 CMF C33 H32 O10

PAGE 1-A



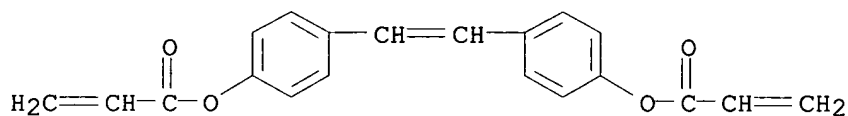
PAGE 1-B



RN 203300-68-9 HCAPLUS
CN 2-Propenoic acid, 1,2-ethenediyl-di-4,1-phenylene ester, homopolymer (9CI)
(CA INDEX NAME)

CM 1

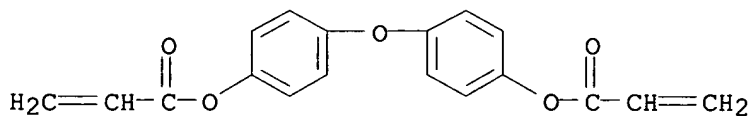
CRN 203300-67-8
CMF C20 H16 O4



RN 326500-87-2 HCAPLUS
CN 2-Propenoic acid, oxydi-4,1-phenylene ester, homopolymer (9CI) (CA INDEX
NAME)

CM 1

CRN 68678-73-9
CMF C18 H14 O5

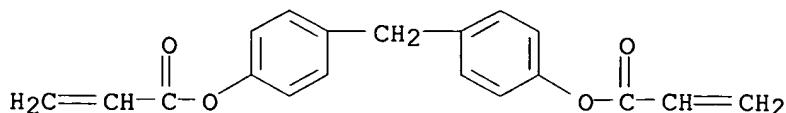


RN 326500-88-3 HCAPLUS
CN 2-Propenoic acid, methylenedi-4,1-phenylene ester, homopolymer (9CI) (CA
INDEX NAME)

CM 1

CRN 326500-86-1

CMF C19 H16 O4



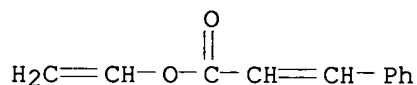
- L48 ANSWER 17 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2000:879064 HCAPLUS
 DN 134:185819
 TI Generation of pretilt angle and liquid crystal aligning capabilities using a photodimerization method on a photopolymer surface
 AU Seo, Dae-Shik; Hwang, Jeoung-Yeon
 CS Department of Electrical & Electronic Engineering, College of Engineering, Yonsei University, Seoul, 120-749, S. Korea
 SO Japanese Journal of Applied Physics, Part 2: Letters (2000), 39(12A), L1239-L1241
 CODEN: JAPL D8; ISSN: 0021-4922
 PB Japan Society of Applied Physics
 DT Journal
 LA English
 AB Pretilt angles and alignment stability were studied for nematic liquid crystal (NLC) using three different **photopolymer alignment** layers and exposure with obliquely polarized light. The generated pretilt angle of the NLC was about 2.7° by polarized UV exposure on PM4Ch (poly(4-methacryloyloxy chalcone)) surface for 1 min. The low pretilt angle for NLC on a PVCi (poly(vinyl)cinamate) surface was observed. The pretilt angle generated in NLC was attributed to the photosensitivity of long side chain containing photopolymer. Good thermal stability of the photopolymers was observed up to 300°. Good LC aligning capabilities using the photodimerization method were observed by annealing-treatment up to 150°.
 CC 74-1 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)
 ST liq crystal **photoalignment photodimerization photosensitive** methacrylic polymer **alignment** film
 IT Interfacial energy
 (anchoring; generation of pretilt angle and liquid crystal **aligning** using **photodimerization** of **photopolymer alignment** layer surface)
 IT Liquid crystal displays
 Molecular orientation
 Thermal stability
 (generation of pretilt angle and liquid crystal **aligning** using **photodimerization** of **photopolymer alignment** layer surface)
 IT Liquid crystals
 (nematic; generation of pretilt angle and liquid crystal **aligning** using **photodimerization** of **photopolymer alignment** layer surface)
 IT Polarized light
 (obliquely; generation of pretilt angle and liquid crystal **aligning** using **photodimerization** of **photopolymer alignment** layer surface)
 IT Dimerization
 (photodimerization; generation of pretilt angle and liquid crystal

aligning using photodimerization of
 photopolymer alignment layer surface)
 IT 24968-99-8 32593-06-9 52049-12-4
 RL: DEV (Device component use); PEP (Physical, engineering or
 chemical process); PROC (Process); USES (Uses)
 (alignment layer; generation of pretilt angle and liq
 . crystal aligning using photodimerization
 of photopolymer alignment layer surface)
 IT 24968-99-8 32593-06-9 52049-12-4
 RL: DEV (Device component use); PEP (Physical, engineering or
 chemical process); PROC (Process); USES (Uses)
 (alignment layer; generation of pretilt angle and liq
 . crystal aligning using photodimerization
 of photopolymer alignment layer surface)
 RN 24968-99-8 HCAPLUS
 CN 2-Propenoic acid, 3-phenyl-, ethenyl ester, homopolymer (9CI) (CA INDEX
 NAME)

CM 1

CRN 3098-92-8

CMF C11 H10 O2

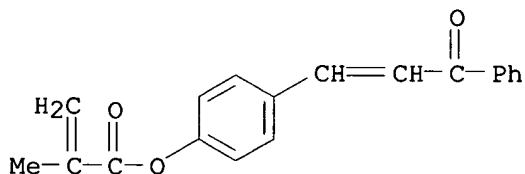


RN 32593-06-9 HCAPLUS
 CN 2-Propenoic acid, 2-methyl-, 4-(3-oxo-3-phenyl-1-propenyl)phenyl ester,
 homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 36452-05-8

CMF C19 H16 O3

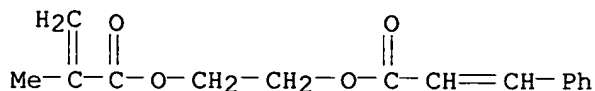


RN 52049-12-4 HCAPLUS
 CN 2-Propenoic acid, 2-methyl-, 2-hydroxyethyl ester, polymer with
 2-[(1-oxo-3-phenyl-2-propenyl)oxy]ethyl 2-methyl-2-propenoate (9CI) (CA
 INDEX NAME)

CM 1

CRN 41261-99-8

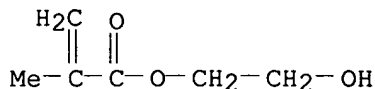
CMF C15 H16 O4



CM 2

CRN 868-77-9

CMF C6 H10 O3



RE.CNT 19 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L48 ANSWER 18 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2000:850520 HCAPLUS
DN 134:170765
TI A new method to align liquid crystal molecules by linear
photopolymerization for liquid crystal display
AU Liang, Zhao-Yan; Kun, Fang; Li, Xuan; Huang, Xi-Min; Ding, Bao-Quan; Lu,
Ran; Zhao, Ying-Ying
CS Changchun Institute of Optics, Fine Mechanics & Physics, Chinese Academy
of Sciences, Changchun, 130021, Peop. Rep. China
SO Chinese Physics (Beijing) (2000), 9(11), 837-840
CODEN: CHPHF4; ISSN: 1009-1963
PB Chinese Physical Society
DT Journal
LA English
AB A new technique to uniformly align liquid crystal mols. is presented. The
technique is based on producing an anisotropic surface on the glass
substrate by photopolymn. with linearly polarized UV-light. The
orientation of liquid crystal mols. was governed by the direction of the
polarized vector of UV-light. Using this method, the authors have studied
the **photopolymer PSi-CM aligning LC 6710A** mols. The
liquid crystal microscopic texture between crossed polarizers, optical
retardation from **liquid crystal layers** and
electrooptical properties were determined for twisted nematic liquid crystal
display cell with one substrate side with photoalignment and the other
side with alignment by rubbing.
CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and
Other Reprographic Processes)
ST **liq crystal display linear photopolymn
alignment layer**
IT Electrooptical effect
Liquid crystal displays
(alignment of liquid crystal mols. by linear **photopolymn. of
aligning layer**)
IT Silsesquioxanes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or
engineered material use); PROC (Process); USES (Uses)
(alignment of liquid crystal mols. by linear **photopolymn. of
aligning layer**)

IT Molecular orientation
 (photoinduced; alignment of liquid crystal mols. by
 linear photopolymn. of aligning layer)

IT Polymerization
 (photopolymn.; alignment of liquid crystal mols. by
 linear photopolymn. of aligning layer)

IT 324766-41-8 324766-45-2
 RL: DEV (Device component use); RCT (Reactant); RACT (Reactant
 or reagent); USES (Uses)
 (alignment layer; alignment of liquid crystal
 mols. by linear photopolymn. of aligning layer)

IT 194044-56-9, CP9001LA 268545-84-2, LC 6710A
 RL: DEV (Device component use); PEP (Physical, engineering or
 chemical process); PROC (Process); USES (Uses)
 (alignment of liquid crystal mols. by linear photopolymn. of
 aligning layer)

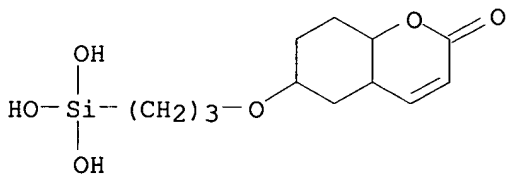
IT 324766-41-8 324766-45-2
 RL: DEV (Device component use); RCT (Reactant); RACT (Reactant
 or reagent); USES (Uses)
 (alignment layer; alignment of liquid crystal
 mols. by linear photopolymn. of aligning layer)

RN 324766-41-8 HCAPLUS
 CN 2H-1-Benzopyran-2-one, 4a,5,6,7,8,8a-hexahydro-6-[3-
 (trihydroxysilyl)propoxy]-, homopolymer (9CI) (CA INDEX NAME)

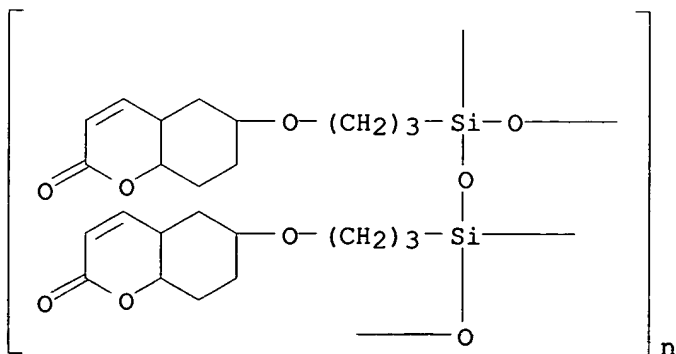
CM 1

CRN 324766-40-7

CMF C12 H20 O6 Si



RN 324766-45-2 HCAPLUS
 CN Poly[[1,3-bis[3-[(4a,5,6,7,8,8a-hexahydro-2-oxo-2H-1-benzopyran-6-yl)oxy]propyl]-1,3:1,3-disiloxanediylidene]bis(oxy)] (9CI) (CA INDEX NAME)



RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L48 ANSWER 19 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2000:804016 HCAPLUS

DN 133:357379

TI Formation of alignment posts and structures and manufacture of **devices** equipped with alignment posts and optical interference layers

IN Con, Sik On; Rajgopal, Rajan; Wong, George

PA Chartered Semiconductor Manufacturing Ltd., Singapore

SO Jpn. Kokai Tokkyo Koho, 10 pp.

CODEN: JKXXAF

DT **Patent**

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000314894	A2	20001114	JP 2000-60752	20000306 <--
	US 6815239	B1	20041109	US 1999-262000	19990305 <--
	SG 99284	A1	20031027	SG 1999-3084	19990621 <--
PRAI	US 1999-262000	A	19990305	<--	

AB The invention relates to **photolithog.** formation of **alignment** posts and optical interference **layers** in between mirror pixels of **liquid crystal**-on-silicon microdisplay **devices**. Formation of elec. insulating alignment posts in patterned active elements formed in Si semiconductor wafers, **device** structures comprising of combination of active elements in Si and elec. insulating alignment posts, and structures and manufacture of **devices** comprising of combination of active elements in Si, elec. insulating alignment posts, and optical interference layers are claimed.

IC ICM G02F001-1339

ICS G02F001-1333; G02F001-1335; G02F001-1368; G09F009-00

CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)

Section cross-reference(s): 76

ST liq crystal silicon semiconductor microdisplay **device**; elec insulator alignment post active **device**; optical interference layer microdisplay **device**

IT Polyimides, uses

RL: **DEV (Device component use)**; USES (Uses)

(alignment posts; manufacture of liquid crystal-on-silicon microdisplays

with

alignment posts and optical interference layers)

IT Vapor deposition process

(plasma, formation of optical interference **layers** by; manufacture of **liquid crystal**-on-silicon microdisplays with alignment posts and optical interference layers)

IT 7631-86-9, Silicon dioxide, uses

RL: **DEV (Device component use)**; USES (Uses)

(alignment posts and optical interference **layers**; manufacture of **liquid crystal**-on-silicon microdisplays with alignment posts and optical interference layers)

IT 1314-36-9, Yttrium oxide, processes 1344-28-1, Aluminum oxide, processes 7789-75-5, Calcium fluoride, processes **9011-14-7D**, Poly(methyl methacrylate), acyl derivs. 113443-18-8, Silicon monoxide

RL: PEP (Physical, engineering or chemical process); PROC (Process)

(alignment posts formation by lift-off process; manufacture of liquid

crystal-on-silicon microdisplays with alignment posts and optical interference layers)

IT 7440-21-3, Silicon, uses
 RL: **DEV (Device component use); USES (Uses)**
 (manufacture of liquid crystal-on-silicon microdisplays with alignment posts and optical interference layers)

IT 12033-89-5, Silicon nitride, uses
 RL: **DEV (Device component use); USES (Uses)**
 (optical interference **layers**; manufacture of **liquid crystal**-on-silicon microdisplays with alignment posts and optical interference layers)

IT **9011-14-7D**, Poly(methyl methacrylate), acyl derivs.
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (alignment posts formation by lift-off process; manufacture of liquid crystal-on-silicon microdisplays with alignment posts and optical interference layers)

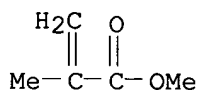
RN 9011-14-7 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, methyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 80-62-6

CMF C5 H8 O2



L48 ANSWER 20 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2000:421422 HCAPLUS

DN 133:51327

TI Orientation **layer** for **liquid-crystal** display **device**

IN Funfschilling, Jurg; Stalder, Martin; Schadt, Martin

PA Rolic Ag, Switz.

SO PCT Int. Appl., 15 pp.
 CODEN: PIXXD2

DT **Patent**

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000036463	A1	20000622	WO 1999-IB1938	19991206 <--
	W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	EP 1147452	A1	20011024	EP 1999-956284	19991206 <--
	EP 1147452	B1	20040818		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,				

IE, SI, LT, LV, FI, RO

JP 2002532755	T2	20021002	JP 2000-588646	19991206 <--
AT 274198	E	20040915	AT 1999-956284	19991206 <--
US 6597422	B1	20030722	US 2001-868035	20010614 <--

PRAI GB 1998-27540 A 19981215 <--
 GB 1998-28283 A 19981222 <--
 WO 1999-IB1938 W 19991206 <--

AB A liquid-crystal display **device** comprising a ferroelec. liquid crystal material aligned by a **liquid crystal** polymer network **layer** under 20 nm thick, which itself is **aligned** by a **photooriented** linearly photopolymd. layer under 20 nm thick, exhibits a low voltage drop over the aligning layer and has a remarkable contrast ratio.

IC ICM G02F001-1337

CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)

ST **liq crystal** display **alignment layer**
photooriented linear polymer; photopolymd **layer** linearly **photooriented alignment liq crystal** display

IT **Liquid crystal** displays
 (liquid crystal polymer network **layers**
aligned by **photooriented** linearly photopolymd. layers
 as orientation layers for)

IT 232941-79-6
 RL: **DEV (Device component use)**; TEM (Technical or engineered material use); USES (Uses)
 (ferroelec. liquid-crystal display **device** aligned by
liquid crystal polymer network **layer**
aligned by **photooriented** layer of)

IT 276256-86-1
 RL: **DEV (Device component use)**; TEM (Technical or engineered material use); USES (Uses)
 (ferroelec. liquid-crystal display **device** aligned by
photooriented linearly photopolymd. layer and network layer of)

IT 276256-86-1
 RL: **DEV (Device component use)**; TEM (Technical or engineered material use); USES (Uses)
 (ferroelec. liquid-crystal display **device** aligned by
photooriented linearly photopolymd. layer and network layer of)

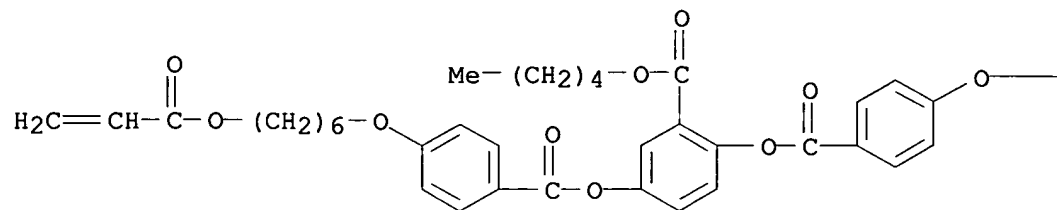
RN 276256-86-1 HCAPLUS

CN Benzoic acid, 2,5-bis[[4-[[6-[(1-oxo-2-propenyl)oxy]hexyl]oxy]benzoyl]oxy]-, pentyl ester, polymer with 2-chloro-1,4-phenylene bis[4-[[6-[(1-oxo-2-propenyl)oxy]hexyl]oxy]benzoate] and 2-methyl-1,4-phenylene bis[4-[[6-[(1-oxo-2-propenyl)oxy]hexyl]oxy]benzoate] (9CI) (CA INDEX NAME)

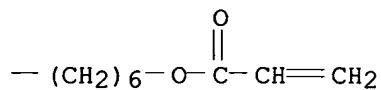
CM 1

CRN 185993-72-0
 CMF C44 H52 O12

PAGE 1-A



PAGE 1-B

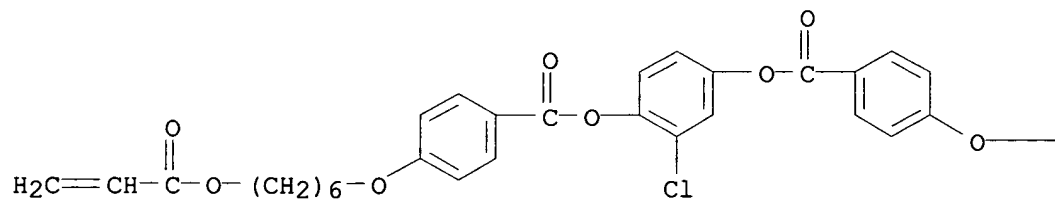


CM 2

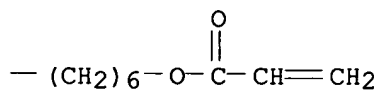
CRN 150809-90-8

CMF C38 H41 Cl O10

PAGE 1-A



PAGE 1-B

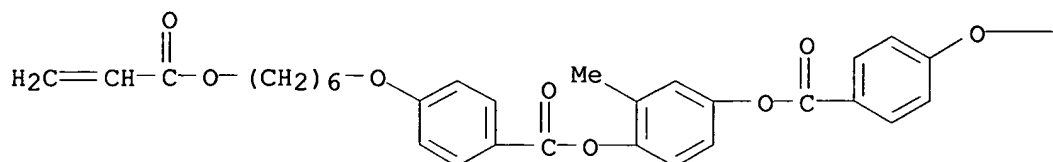


CM 3

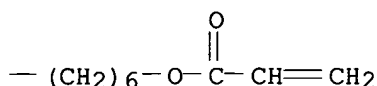
CRN 125248-71-7

CMF C39 H44 O10

PAGE 1-A



PAGE 1-B



RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L48 ANSWER 21 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2000:344141 HCAPLUS
DN 132:327749
TI Liquid crystal display **device** and method of manufacturing same
IN Woo, Joung Won; Choi, Jae Beom
PA LG Electronics Inc., S. Korea
SO U.S., 9 pp.
CODEN: USXXAM

DT **Patent**
LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6067140	A	20000523	US 1997-969470	19971113 <--
PRAI	KR 1997-6882	A	19970303	<--	
	KR 1997-26085	A	19970620	<--	

AB A liquid crystal display **device** having a plurality of pixels, each pixel having a plurality of domains. In boundary regions between the domains, an opaque metal layer is formed to shield light transmission through these boundary regions and also to stabilize potential applied to pixel electrodes. A polyimide or **photo-sensitive alignment** layer is rubbed by fabric or exposed to light to provide alignment directions.

IC ICM C02F001-1337
ICS C02F001-1333; C02F001-1343

NCL 349129000

CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)

ST multidomain **liq crystal** display manuf polyimide alignment **layer**

IT Liquid crystal displays

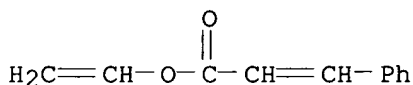
(multidomain liquid crystal display and its manufacture utilizing polyimide or

photo-sensitive alignment layer)

IT Polyimides, uses

Polysiloxanes, uses

RL: DEV (Device component use); USES (Uses)
 (multidomain liquid crystal display and its manufacture utilizing polyimide
 or photo-sensitive alignment layer)
 IT 24968-99-8, Polyvinylcinnamate
 RL: DEV (Device component use); USES (Uses)
 (multidomain liquid crystal display and its manufacture utilizing polyimide
 or photo-sensitive alignment layer)
 IT 24968-99-8, Polyvinylcinnamate
 RL: DEV (Device component use); USES (Uses)
 (multidomain liquid crystal display and its manufacture utilizing polyimide
 or photo-sensitive alignment layer)
 RN 24968-99-8 HCAPLUS
 CN 2-Propenoic acid, 3-phenyl-, ethenyl ester, homopolymer (9CI) (CA INDEX
 NAME)
 CM 1
 CRN 3098-92-8
 CMF C11 H10 O2



RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L48 ANSWER 22 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1999:661509 HCAPLUS
 DN 132:17074
 TI Electrically aligned photo-polymer films for liquid
 crystal alignment
 AU Kim, Mee Whi; Rastegar, Abbas; Olenik, Irena Drevensek; De Witte, Pieter;
 Kim, Mahn Won; Rasing, Theo
 CS Research Institute for Materials, University of Nijmegen, Nijmegen, 6525
 ED, Neth.
 SO Molecular Crystals and Liquid Crystals Science and Technology, Section A:
 Molecular Crystals and Liquid Crystals (1999), 329, 1053-1058
 CODEN: MCLCE9; ISSN: 1058-725X
 PB Gordon & Breach Science Publishers
 DT Journal
 LA English
 AB The photo and elec. field alignment of thin film of polyvinylcinnamate
 (PVCN) is considerably enhanced by using a combination of both methods.
 ITO-coated glass substrates were covered with a PVCN film using spin or
 dip coating and then heated above the glass transition temperature of PVCN.
 The
 alignment was induced by applying an elec. field and stabilized by [2+2]
 cycloaddn. of the polymer using a linearly polarized UV light. The
 anisotropy of the aligned polymer films was checked by measuring linear
 birefringence. Without crosslinking, the anisotropy of the elec. aligned
 films is very weak. Crosslinked PVCN films using polarized UV light in
 the absence of any external fields lead to a better anisotropy than the
 aligned film by an elec. field. The anisotropy is however increased

substantially when the aligned PVCN films were crosslinked in the presence of a field.

CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)
Section cross-reference(s): 38, 75, 76

IT **Liquid crystal** displays
(alignment **layer**; elec. field induced alignment of polyvinylcinnamate and stabilization by polarized UV-induced crosslinking)

IT **24968-99-8**, Polyvinylcinnamate
RL: **DEV (Device component use)**; NUU (Other use, unclassified);
PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(elec. field alignment of side-chains above glass transition, and stabilization by polarized UV-induced crosslinking)

IT **24968-99-8**, Polyvinylcinnamate
RL: **DEV (Device component use)**; NUU (Other use, unclassified);
PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(elec. field alignment of side-chains above glass transition, and stabilization by polarized UV-induced crosslinking)

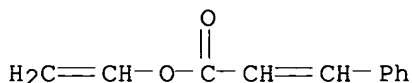
RN 24968-99-8 HCAPLUS

CN 2-Propenoic acid, 3-phenyl-, ethenyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 3098-92-8

CMF C11 H10 O2



RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L48 ANSWER 23 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1999:462550 HCAPLUS

DN 131:206887

TI Optical anisotropy of photo-crosslinkable polymer film and photoalignment control of nematic liquid crystals using nonpolarized ultraviolet irradiation

AU Kawatsuki, Nobuhiro; Yamamoto, Tohei; Ono, Hiroshi

CS Department of Applied Chemistry, Himeji Institute of Technology, Himeji, 671-2201, Japan

SO Polymer Journal (Tokyo) (1999), 31(7), 630-632
CODEN: POLJB8; ISSN: 0032-3896

PB Society of Polymer Science, Japan

DT Journal

LA English

AB The purpose of this paper is to describe an anisotropic photo-crosslinking reaction of a polymer film containing photo-crosslinkable 4-cinnamoyloxybiphenyl group by a slantwise nonpolarized UV irradiation, and a photoalignment control of nematic LC with tilt resultant film.

CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)

Section cross-reference(s): 38, 75

ST optical anisotropy photo crosslinkable polymer film photoalignment control; **photochem** cinnamic ester **photoalignment** **photocrosslinkable** polymer liq crystal; liq **crystal** display **alignment layer** **photoalignment** nonpolarized UV irradiation

IT 182480-78-0
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses) (optical anisotropy of photo-crosslinkable polymer film and photoalignment control of nematic liquid crystals using nonpolarized UV irradiation)

IT 182480-78-0
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses) (optical anisotropy of photo-crosslinkable polymer film and photoalignment control of nematic liquid crystals using nonpolarized UV irradiation)

RN 182480-78-0 HCAPLUS

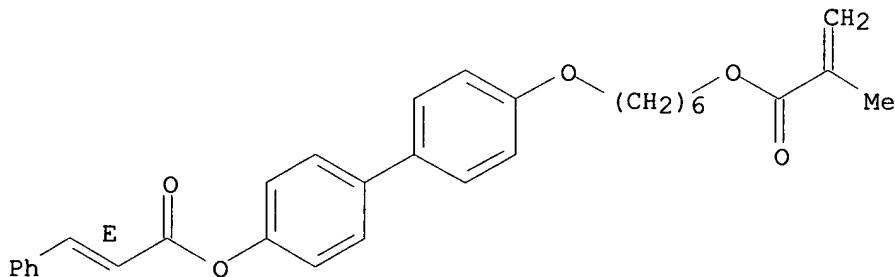
CN 2-Propenoic acid, 2-methyl-, 6-[[4'-[[[(2E)-1-oxo-3-phenyl-2-propenyl]oxy][1,1'-biphenyl]-4-yl]oxy]hexyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 182480-74-6

CMF C31 H32 O5

Double bond geometry as shown.



RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L48 ANSWER 24 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1998:10342 HCAPLUS

DN 128:134309

TI A convenient preparation of photoactive **monolayers** for **liquid crystal** photoalignment by the surface adsorption of an aminoalkylated azobenzene on poly(acrylic acid) films

AU Furumi, Seiichi; Akiyama, Haruhisa; Morino, Shin-ya; Ichimura, Kunihiro

CS Tokyo Institute of Technology, Research Laboratory of Resources Utilization, Midori-ku Yokohama, 226, Japan

SO Journal of Materials Chemistry (1998), 8(1), 65-70
 CODEN: JMACEP; ISSN: 0959-9428

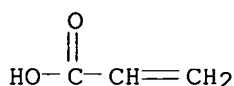
PB Royal Society of Chemistry

DT Journal

LA English

- AB Spin-cast poly(acrylic acid) (pAA) films on a substrate plate are immersed in a hexane solution of 4-butyl-4'-(10-aminodecyloxy)azobenzene, resulting in surface-selective adsorption and leading to the formation of photoactive monolayers. The surface adsorption behavior is critically affected by the concentration of the azobenzene adsorbate solns., and a 2.5×10^{-5} mol-dm⁻³ solution gives an azobenzene monolayer with a surface d. of 2 mols. nm⁻² without any modification of the surface morphol. of the pAA film. The surface d. of the azobenzene is controlled by a binary system consisting of the azobenzene and n-octadecylamine. Photoirradn. of the surface-modified film with linearly polarized UV light for E-to-Z photoisomerization results in the orientational transformation of the nematic **liquid crystal layer** from homeotropic to homogeneous alignment. It has been found that the min. exposure energy of polarized UV light required for the liquid crystal **alignment photocontrol** is determined by the surface d. of the azobenzene. There is a critical d.; no photoresponse is observed for average densities of the azobenzene smaller than ca. 0.7 mols.-nm⁻². With densities larger than this value, the smaller the d. of the chromophore on pAA surface is, the faster the photoreorientation of the liquid crystal effectively takes place.
- CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)
- ST liq crystal photoalignment surface adsorption azobenzene; command **layer liq crystal** photoalignment; aminoalkylated azobenzene liq crystal photoalignment
- IT Isomerization
Isomerization
(cis-trans, photochem.; preparation of photoactive **monolayers** for **liquid crystal** photoalignment by surface adsorption of aminoalkylated azobenzene on poly(acrylic acid) films)
- IT Absorption spectra
Adsorbed substances
Adsorption
Liquid crystal displays
Surface photochemistry
(preparation of photoactive **monolayers** for **liquid crystal** photoalignment by surface adsorption of aminoalkylated azobenzene on poly(acrylic acid) films)
- IT 152556-04-2, NPC-02
RL: **DEV (Device component use)**; USES (Uses)
(preparation of photoactive **monolayers** for **liquid crystal** photoalignment by surface adsorption of aminoalkylated azobenzene on poly(acrylic acid) films)
- IT **9003-01-4**, Poly(acrylic acid) 191678-42-9, trans-4-Butyl-4'-(10-aminodecyloxy)azobenzene 201859-09-8, cis-4-Butyl-4'-(10-aminodecyloxy)azobenzene
RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(preparation of photoactive **monolayers** for **liquid crystal** photoalignment by surface adsorption of aminoalkylated azobenzene on poly(acrylic acid) films)
- IT 102184-99-6, LCD118
RL: MOA (Modifier or additive use); USES (Uses)
(preparation of photoactive **monolayers** for **liquid crystal** photoalignment by surface adsorption of aminoalkylated azobenzene on poly(acrylic acid) films)
- IT 124-30-1, n-Octadecylamine
RL: NUU (Other use, unclassified); USES (Uses)
(preparation of photoactive **monolayers** for **liquid crystal** photoalignment by surface adsorption of aminoalkylated

azobenzene on poly(acrylic acid) films)
 IT 9003-01-4, Poly(acrylic acid)
 RL: DEV (Device component use); PEP (Physical, engineering or
 chemical process); PROC (Process); USES (Uses)
 (preparation of photoactive **monolayers** for **liquid**
crystal photoalignment by surface adsorption of aminoalkylated
 azobenzene on poly(acrylic acid) films)
 RN 9003-01-4 HCAPLUS
 CN 2-Propenoic acid, homopolymer (9CI) (CA INDEX NAME)
 CM 1
 CRN 79-10-7
 CMF C3 H4 O2



RE.CNT 45 THERE ARE 45 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L48 ANSWER 25 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1997:739285 HCAPLUS
 DN 128:55304
 TI Liquid crystal **alignment** by **photoprocessed** polymer
 films
 AU Lazarev, V. V.; Barnik, M. I.; Shtykov, N. M.
 CS Russian State Center of Science, Organic Intermediates and Dyes Institute,
 Moscow, 103787, Russia
 SO Molecular Crystals and Liquid Crystals Science and Technology, Section C:
 Molecular Materials (1997), 8(3), 235-244
 CODEN: MOMAEO; ISSN: 1058-7276
 PB Gordon & Breach
 DT Journal
 LA English
 AB Liquid crystals (LC's) **alignment** induced by **photosensitive**
 polymers irradiated with linearly polarized light was investigated. It
 was found that for all photoprocessed polymer films the optical anisotropy
 was induced with the slow axis perpendicular to the direction of light
 elec. vector, and that the director of an aligned LC coincided with the
 slow axis of the anisotropic polymer films. It was also shown that the
 trans-cis photoisomerization of dopants does not play a determinant role
 in the photoinduced optical anisotropy phenomenon. A possible mechanism
 for photoinducing the optical anisotropy in doped polymer films is
 discussed.
 CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and
 Other Reprographic Processes)
 Section cross-reference(s): 73, 75
 ST liq crystal **alignment photopolymer** vinylcinnamate
 polymer; photoalignment liq crystal dye doped polymer
 IT Isomerization
 Isomerization
 (cis-trans, **photochem.**; liquid crystal **photoalignment**
 induced by **photopolymer** films and by dye-doped polymers)
 IT Dopants
 Liquid crystal displays

Liquid crystals
 (liquid crystal **photoalignment** induced by **photopolymer** films and by dye-doped polymers)

IT Optical anisotropy
 (**photoinduced**; liquid crystal **photoalignment** induced by **photopolymer** films and by dye-doped polymers)

IT 40817-08-1, Pentyl cyanobiphenyl
 RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (alignment of liquid crystals induced by photosensitive polymers irradiated with linearly polarized light)

IT 9003-53-6, Polystyrene **9011-14-7**, PMMA **25213-24-5**, Vinyl-acetate-vinyl alcohol copolymer
 RL: **DEV (Device component use)**; USES (Uses)
 (dye-doped alignment **layer**; **liquid crystal photoalignment** induced by **photopolymer** films and by dye-doped polymers)

IT 200049-70-3
 RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (liquid crystal **photoalignment** induced by **photopolymer** films and by dye-doped polymers)

IT 725-14-4 2497-37-2 3025-52-3 7116-97-4 17951-64-3 19221-08-0
 59662-49-6 68021-27-2 88038-94-2 88912-07-6 88912-08-7
 107853-96-3 160251-78-5 188447-94-1 200049-67-8 200049-68-9
 200049-69-0
 RL: MOA (Modifier or additive use); USES (Uses)
 (liquid crystal **photoalignment** induced by **photopolymer** films and by dye-doped polymers)

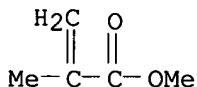
IT **24968-99-8 32732-28-8 200049-72-5**
 RL: **DEV (Device component use)**; USES (Uses)
 (**photopolymer alignment layer**; **liquid crystal photoalignment** induced by **photopolymer** films and by dye-doped polymers)

IT **9011-14-7**, PMMA **25213-24-5**, Vinyl-acetate-vinyl alcohol copolymer
 RL: **DEV (Device component use)**; USES (Uses)
 (dye-doped alignment **layer**; **liquid crystal photoalignment** induced by **photopolymer** films and by dye-doped polymers)

RN 9011-14-7 HCAPLUS
 CN 2-Propenoic acid, 2-methyl-, methyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

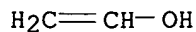
CRN 80-62-6
 CMF C5 H8 O2



RN 25213-24-5 HCAPLUS
 CN Acetic acid ethenyl ester, polymer with ethenol (9CI) (CA INDEX NAME)

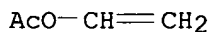
CM 1

CRN 557-75-5
CMF C2 H4 O



CM 2

CRN 108-05-4
CMF C4 H6 O2



IT 24968-99-8 32732-28-8 200049-72-5

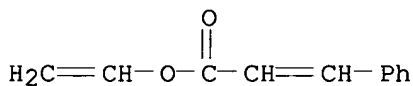
RL: DEV (Device component use); USES (Uses)
(photopolymer alignment layer;
liquid crystal photoalignment induced by
photopolymer films and by dye-doped polymers)

RN 24968-99-8 HCAPLUS

CN 2-Propenoic acid, 3-phenyl-, ethenyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 3098-92-8
CMF C11 H10 O2

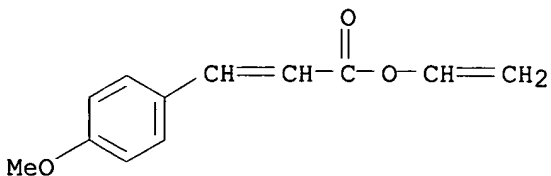


RN 32732-28-8 HCAPLUS

CN 2-Propenoic acid, 3-(4-methoxyphenyl)-, ethenyl ester, homopolymer (9CI)
(CA INDEX NAME)

CM 1

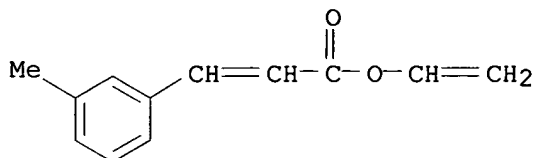
CRN 10604-64-5
CMF C12 H12 O3



RN 200049-72-5 HCAPLUS

CN 2-Propenoic acid, 3-(3-methylphenyl)-, ethenyl ester, homopolymer (9CI)
(CA INDEX NAME)

CM 1

CRN 200049-71-4
CMF C12 H12 O2RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L48 ANSWER 26 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1997:619186 HCAPLUS
 DN 127:313205
 TI Manufacture of liquid-crystal cell by rubbing-free alignment method
 IN Yamazoe, Hiroshi
 PA Matsushita Electric Industrial Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 16 pp.
 CODEN: JKXXAF

DT **Patent**
LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09244031	A2	19970919	JP 1996-57489	19960314 <--
	JP 3572787	B2	20041006		
PRAI	JP 1996-57489		19960314 <--		

AB The manufacturing method involves the processes of (A) controlling a temperature of a substrate having a mesogen layer composed of a photopolymn. initiator and a polymerizable liquid-crystalline monomer to keep **liquid-crystallinity** of the **layer**, (B) irradiating UV light on the substrate while applying magnetic field in the required direction as to polymerize the monomer and form a polymer layer, (C) sealing the substrates, and (D) filling liquid crystals between the opposing substrates. The mesogen layer may contain a low-mol.-weight liquid crystal and/or an UV absorber and elec. field may be applied in the process B. The method is useful also in manufacturing other oriented polymer films. The method gives the cells with high pretilt angle without generating dust particles and static.

IC ICM G02F001-1337
 ICS C08F038-00; C08L033-06; C08L033-14; C08L049-00; C08F020-12; C08F020-34

CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)
 Section cross-reference(s): 38

IT Polymerization
 (photopolymn.; rubbing-free **alignment** of **liquid-crystal** cell by photopolymn. of mesogen **layer** under UV radiation)

IT Liquid crystal displays

UV radiation
(rubbing-free alignment of **liquid-crystal** cell by
photopolymn. of mesogen **layer** under UV radiation)

IT 193146-14-4
RL: **DEV (Device component use)**; MOA (Modifier or additive use);
USES (Uses)
(UV absorber; rubbing-free alignment of **liquid-crystal**
cell by photopolymn. of mesogen **layer** under UV radiation)

IT 40817-08-1, 4-Pentyl-4'-cyanobiphenyl 41122-71-8, 4-Heptyl-4'-
cyanobiphenyl 61203-99-4, 1-(p-Cyanophenyl)-4-propylcyclohexane
RL: **DEV (Device component use)**; MOA (Modifier or additive use);
USES (Uses)
(low-mol.-weight liquid crystal; rubbing-free alignment of **liquid-**
crystal cell by photopolymn. of mesogen **layer** under
UV radiation)

IT 193486-56-5P 197316-19-1P 197316-20-4P
197316-21-5P
RL: **DEV (Device component use)**; IMF (Industrial manufacture);
PREP (Preparation); USES (Uses)
(rubbing-free alignment of **liquid-crystal** cell by
photopolymn. of mesogen **layer** under UV radiation)

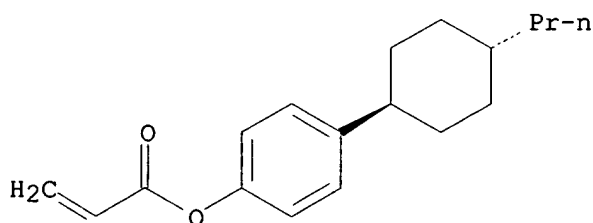
IT 193486-56-5P 197316-19-1P 197316-20-4P
197316-21-5P
RL: **DEV (Device component use)**; IMF (Industrial manufacture);
PREP (Preparation); USES (Uses)
(rubbing-free alignment of **liquid-crystal** cell by
photopolymn. of mesogen **layer** under UV radiation)

RN 193486-56-5 HCAPLUS
CN 2-Propenoic acid, 4-[(4-pentylphenyl)ethynyl]phenyl ester, polymer with
4-(trans-4-propylcyclohexyl)phenyl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

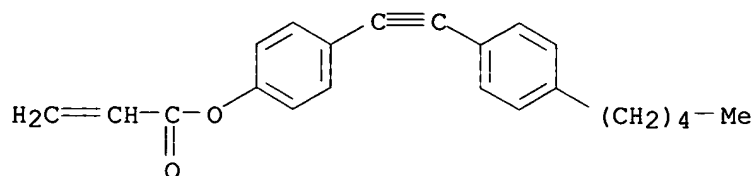
CRN 168274-89-3
CMF C18 H24 O2

Relative stereochemistry.



CM 2

CRN 164114-70-9
CMF C22 H22 O2



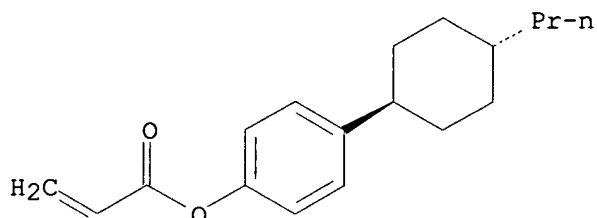
RN 197316-19-1 HCAPLUS
 CN 2-Propenoic acid, 4'-butyl[1,1'-bicyclohexyl]-4-yl ester, [trans(trans)]-,
 polymer with trans-4-(4-propylcyclohexyl)phenyl 2-propenoate (9CI) (CA
 INDEX NAME)

CM 1

CRN 168274-89-3

CMF C18 H24 O2

Relative stereochemistry.

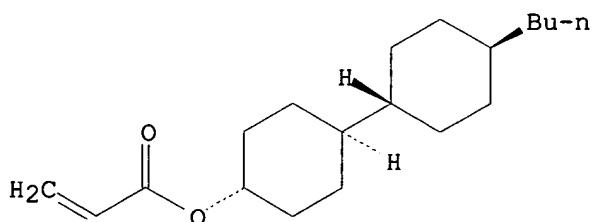


CM 2

CRN 165538-90-9

CMF C19 H32 O2

Relative stereochemistry.



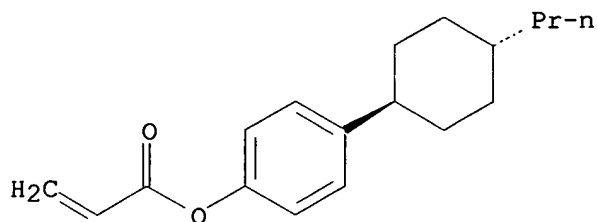
RN 197316-20-4 HCAPLUS
 CN 2-Propenoic acid, 4'-butyl[1,1'-bicyclohexyl]-4-yl ester, [trans(trans)]-,
 polymer with 4-[(4-pentylphenyl)ethynyl]phenyl 2-propenoate and
 trans-4-(4-propylcyclohexyl)phenyl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 168274-89-3

CMF C18 H24 O2

Relative stereochemistry.

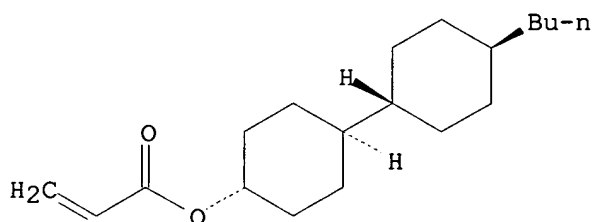


CM 2

CRN 165538-90-9

CMF C19 H32 O2

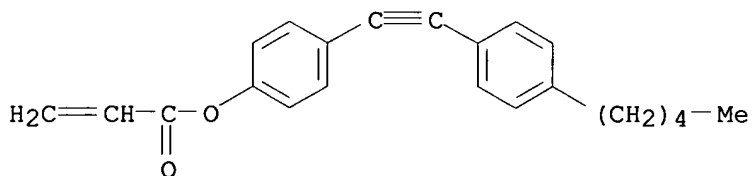
Relative stereochemistry.



CM 3

CRN 164114-70-9

CMF C22 H22 O2



RN 197316-21-5 HCAPLUS

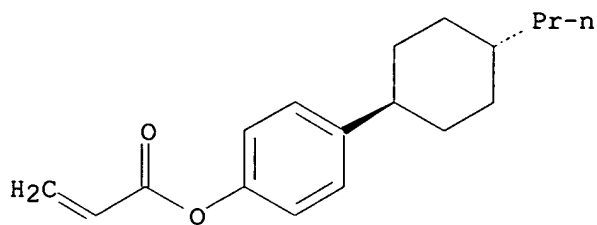
CN 2-Propenoic acid, 4'-cyano[1,1'-biphenyl]-4-yl ester, polymer with 4-[(4-pentylphenyl)ethynyl]phenyl 2-propenoate and 4-(trans-4-propylcyclohexyl)phenyl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 168274-89-3

CMF C18 H24 O2

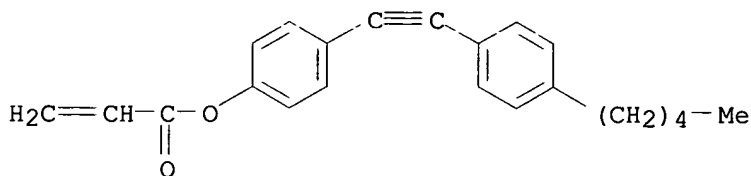
Relative stereochemistry.



CM 2

CRN 164114-70-9

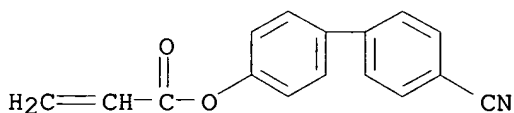
CMF C22 H22 O2



CM 3

CRN 67483-58-3

CMF C16 H11 N O2



L48 ANSWER 27 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1997:265412 HCAPLUS
 DN 126:257102
 TI Liquid-crystal display **device** and its manufacture
 IN Sumyoshi, Ken; Suzuki, Shigeyoshi; Takatori, Kenichi
 PA Nippon Electric Co, Japan
 SO Jpn. Kokai Tokkyo Koho, 11 pp.
 CODEN: JKXXAF

DT **Patent**
 LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09054315	A2	19970225	JP 1995-227089	19950811 <--
PRAI	JP 1995-227089		19950811	<--	
AB	The liquid-crystal display device has a number of areas with different orientation directions, and is equipped with an optical compensating layer having an optical axis in the direction for compensating the birefringence in each area. The optical compensating				

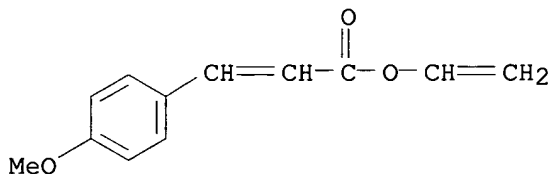
layer is formed on a substrate by forming a **layer** containing a **liquid-crystal** substance with **photo**-crosslinkable groups, **aligning** the layer, exposing to light to cause crosslinking. This liquid-crystal display **device** shows improved viewing angles.

IC ICM G02F001-1335
ICS G02F001-133
CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)
ST **liq crystal** display optical compensating **layer**
IT **Liquid crystal** displays
(optical compensating **layer** for)
IT **32732-28-8P 188619-96-7P**
RL: **DEV (Device component use)**; PNU (Preparation, unclassified);
PREP (Preparation); USES (Uses)
(optical compensating **layer** for **liquid-crystal** display from)
IT **32732-28-8P 188619-96-7P**
RL: **DEV (Device component use)**; PNU (Preparation, unclassified);
PREP (Preparation); USES (Uses)
(optical compensating **layer** for **liquid-crystal** display from)
RN 32732-28-8 HCAPLUS
CN 2-Propenoic acid, 3-(4-methoxyphenyl)-, ethenyl ester, homopolymer (9CI)
(CA INDEX NAME)

CM 1

CRN 10604-64-5

CMF C12 H12 O3



RN 188619-96-7 HCAPLUS
CN 2-Propenoic acid, 1,4-phenylenebis[oxy(4-methyl-6,1-hexanediyl)] ester, [S-(R*,R*)]-, homopolymer (9CI) (CA INDEX NAME)

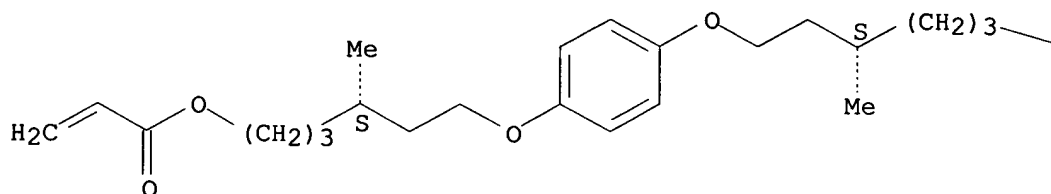
CM 1

CRN 188619-95-6

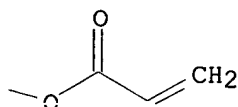
CMF C26 H38 O6

Absolute stereochemistry.

PAGE 1-A



PAGE 1-B



L48 ANSWER 28 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1997:175427 HCAPLUS
 DN 126:310402
 TI Photothermal response characteristics of host-guest liquid crystals
 AU Ono, Hiroshi; Kawatsuki, Nobuhiro
 CS Dep. Electrical Eng., Nagaoka Univ. Technol., Nagaoka, 940-21, Japan
 SO Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes &
 Review Papers (1997), 36(2), 761-766
 CODEN: JAPNDE; ISSN: 0021-4922
 PB Japanese Journal of Applied Physics
 DT Journal
 LA English
 AB Photo-response properties in host-guest liquid crystals were investigated using a crystal rotation method combined with a pump and probe technique. The crystal rotation signals were in good agreement with the calcn. results obtained using the Jones matrix anal. Considering these exptl. results and the relation between the polarization of the pump beam and the signal intensity, it is concluded that the photo-response properties can be explained by a change in the refractive index owing to temperature variation caused by laser light absorption. The refractive index change in host-guest liquid crystals sensitized at a He-Ne laser wavelength (632.8 nm) due to irradiation with a 20 mW of the pump beam (beam diameter was 740 μ m) was estimated to about -0.004. The refractive index change was roughly proportional to the pump beam intensity. The change was reversible and the typical photothermal response time was less than 500 ms.
 CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)
 ST photothermal response liq crystal dye doped; crystal rotation dye doped liq crystal; liq crystal display optical switching **device**
 IT **9002-89-5**, Polyvinyl alcohol 122463-72-3, PVA 205
 RL: PEP (Physical, engineering or chemical process); PROC (Process) (**alignment layer; photothermal response characteristics of liquid crystals doped with dye mols. studied using crystal rotation method**)
 IT **9002-89-5**, Polyvinyl alcohol
 RL: PEP (Physical, engineering or chemical process); PROC (Process) (**alignment layer; photothermal response**)

characteristics of **liquid crystals** doped with dye
 mols. studied using crystal rotation method)
 RN 9002-89-5 HCAPLUS
 CN Ethenol, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 557-75-5
 CMF C2 H4 O

H₂C=CH-OH

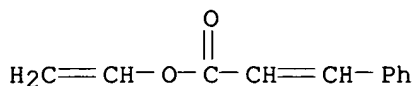
L48 ANSWER 29 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1995:669802 HCAPLUS
 DN 123:241502
 TI Peculiarity of photoaligning of liquid crystals and accompanied effects
 AU Dyadyusha, Andrey; Khizhnyak, Anatolii; Marusii, Tatyana; Reshetnyak,
 Victor; Reznikov, Yuriy; Voloshchenko, Dmirty
 CS Institute Physics, Academy Sciences Ukraine, 252650, Ukraine
 SO Proceedings of SPIE-The International Society for Optical Engineering
 (1995), 2408(Liquid Crystal Materials, Devices and Displays), 151-7
 CODEN: PSISDG; ISSN: 0277-786X
 PB SPIE-The International Society for Optical Engineering
 DT Journal; General Review
 LA English
 AB Review of our results of the steadies of the distribution of the director
 of a nematic liquid crystal in a cell with **photosensitive**
aligning layers is presented. It is shown that a doubly
 degenerate easy orientation axis is induced on the nematic-orientant
 interface. It was also found that the degeneracy of the easy axis
 orientation could be removed by NLC mols. flow during LC cell filling and
 an oblique liquid crystal orientation is realized. The theor. and exptl.
 investigations of the reorientation of the director toward to the
 light-induced easy axis caused by light-induced adsorption of dye mols.
 are presented. As threshold as non-threshold effects are considered. 20
 Refs.
 CC 74-0 (Radiation Chemistry, Photochemistry, and **Photographic** and
 Other Reprographic Processes)
 IT Fluoropolymers
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (director distribution of nematic **liquid crystal** cell
 with **photosensitive aligning layers**)
 IT Optical imaging **devices**
 (electrooptical liquid-crystal, director distribution of nematic
liquid crystal cell with **photosensitive**
aligning layers)
 IT **24968-99-8D**, Poly(vinyl cinnamate), fluorinated 137398-87-9, Zhk
 1285
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (director distribution of nematic **liquid crystal** cell
 with **photosensitive aligning layers**)
 IT **24968-99-8D**, Poly(vinyl cinnamate), fluorinated
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (director distribution of nematic **liquid crystal** cell
 with **photosensitive aligning layers**)
 RN 24968-99-8 HCAPLUS

CN 2-Propenoic acid, 3-phenyl-, ethenyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 3098-92-8

CMF C11 H10 O2



L48 ANSWER 30 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1995:283792 HCAPLUS

DN 122:42585

TI Surface-Selective Modification of Poly(vinyl alcohol) Films with Azobenzenes for In-Plane **Alignment Photocontrol** of Nematic Liquid Crystals

AU Akiyama, Haruhisa; Momose, Masayuki; Ichimura, Kunihiro; Yamamura, Shigeo
CS Research Laboratory of Resources Utilization, Tokyo Institute of Technology, Yokohama, 227, Japan

SO Macromolecules (1995), 28(1), 288-93

CODEN: MAMOBX; ISSN: 0024-9297

PB American Chemical Society

DT Journal

LA English

AB A surface of poly(vinyl alc.) (PVA) was treated with an azobenzene acid chloride in hexane in the presence of pyridine to achieve surface-selective introduction of the photoisomerizable azo units. The surface reaction is affected by the solvent, saponification degree of PVA, structure of the acid chloride, and reaction period. Surface morphol. of the modified PVA thin films was examined by means of atomic force microscopy. Under optimized reaction conditions, a PVA surface was covered with an average of about 3 azobenzene units per 1 nm² to afford a film with excellent flatness. The azo-modified PVA films were employed to regulate in-plane alignment of a nematic liquid crystal by irradiation with linearly polarized light of a hybrid cell which was fabricated by putting a liquid crystal between a glass plate covered with the modified PVA film and a glass plate which was treated with lecithin for a homeotropic alignment. The efficiency of the photoregularity for azimuthal reorientation of liquid crystal was markedly dependent on the mol. structure of azobenzenes. Various properties of the photoresponsive liquid cells are presented.

CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)

IT Optical imaging **devices**

(electrooptical liquid-crystal, photocontrol of nematic liquid crystal alignment by poly(vinyl alc.) surface modified with azobenzene acid chloride)

IT **9002-89-5D**, saponified, surface esterified with azobenzene acid chlorides

RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)

(**alignment layer; photocontrol of nematic liquid crystal alignment by**)

IT 160013-12-7P 160013-13-8P 160013-14-9P

RL: **DEV (Device component use)**; RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
 (photocontrol of nematic liquid crystal alignment by poly(vinyl alc.) surface modified with)

IT 40817-08-1, 5CB 115288-48-7, DON-103 152556-04-2, NPC 02
 RL: **DEV (Device component use)**; USES (Uses)
 (photocontrol of nematic liquid crystal alignment by poly(vinyl alc.) surface modified with azobenzene acid chloride)

IT **9002-89-5**
 RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)
 (surface modification with azobenzene acid chloride of saponified and partially saponified poly(vinyl alc.) for photocontrol of nematic liquid crystal alignment)

IT **9002-89-5D**, saponified, surface esterified with azobenzene acid chlorides
 RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)
 (alignment layer; photocontrol of nematic liquid crystal alignment by)

RN 9002-89-5 HCAPLUS
 CN Ethenol, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 557-75-5
 CMF C2 H4 O

$\text{H}_2\text{C}=\text{CH}-\text{OH}$

IT **9002-89-5**
 RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)
 (surface modification with azobenzene acid chloride of saponified and partially saponified poly(vinyl alc.) for photocontrol of nematic liquid crystal alignment)

RN 9002-89-5 HCAPLUS
 CN Ethenol, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 557-75-5
 CMF C2 H4 O

$\text{H}_2\text{C}=\text{CH}-\text{OH}$

L48 ANSWER 31 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1995:114199 HCAPLUS
 DN 122:92684
 TI Anisotropic alignment of a nematic liquid crystal controlled by a polarization sensitive Langmuir-Blodgett command layer

AU Sekkat, Z.; Buechel, M.; Orendi, H.; Knobloch, H.; Seki, T.; Ito, S.;
Koberstein, J.; Knoll, W.

CS Max-Planck-Institut fuer Polymerforschung, Ackermannweg 10, Mainz, 55128,
Germany

SO Optics Communications (1994), 111(3-4), 324-30
CODEN: OPCOB8; ISSN: 0030-4018

PB Elsevier

DT Journal

LA English

AB We investigate the homeotropic .dblarw. planar switching in the alignment
of a nematic liquid crystal (LC) controlled by Langmuir-Blodgett command
layers of polymer containing photochromic azobenzene mols. in the side chain.
Waveguide spectroscopy is used to probe the changes in the optical
properties of the LC induced by the cis \leftrightarrow trans photoisomerization
of the azobenzene units. This optical method provides a high sensitivity
for studying the orientation of the LC both within and perpendicular to
the plane of waveguide cell. The study of the dynamics of the switching
induced by polarized uv light shows that initially the LC mols. follow the
movement of the azobenzene units but that eventually they align with the
dipping direction. An explanation for this effect based on the movement
of the azobenzene units themselves is proposed.

CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and
Other Reprographic Processes)

IT Optical imaging **devices**
(electrooptical liquid-crystal, nematic; anisotropic alignment controlled
by polarization sensitive Langmuir-Blodgett command layer of poly(vinyl
alc.) containing photochromic azobenzene units)

IT Isomerization
(**photochem., alignment** of nematic liquid
crystal controlled by Langmuir-Blodgett command **layer**
of of poly(vinyl alc.) containing photochromic azobenzene units)

IT 115288-48-7, DON 103 **137515-35-6**
RL: **DEV (Device component use)**; PEP (Physical, engineering or
chemical process); PROC (Process); USES (Uses)
(anisotropic alignment of nematic liquid crystal controlled by
polarization sensitive Langmuir-Blodgett command layer of of poly(vinyl
alc.) containing photochromic azobenzene units)

IT **137515-35-6**
RL: **DEV (Device component use)**; PEP (Physical, engineering or
chemical process); PROC (Process); USES (Uses)
(anisotropic alignment of nematic liquid crystal controlled by
polarization sensitive Langmuir-Blodgett command layer of of poly(vinyl
alc.) containing photochromic azobenzene units)

RN 137515-35-6 HCAPLUS

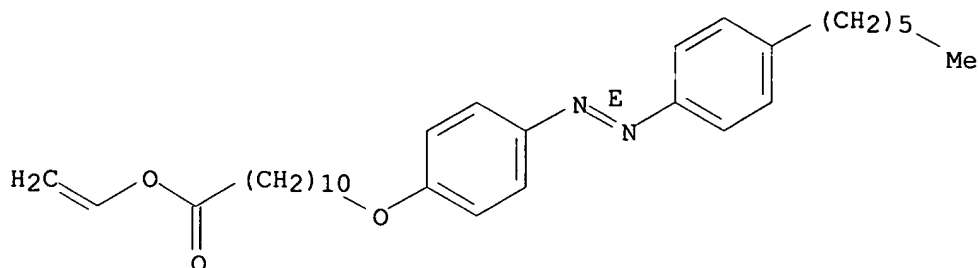
CN Undecanoic acid, 11-[4-[(1E)-(4-hexylphenyl)azo]phenoxy]-, ethenyl ester,
polymer with ethenol (9CI) (CA INDEX NAME)

CM 1

CRN 137515-34-5

CMF C31 H44 N2 O3

Double bond geometry as shown.



CM 2

CRN 557-75-5

CMF C2 H4 O

H₂C=CH-OH

L48 ANSWER 32 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1994:521568 HCAPLUS

DN 121:121568

TI Detection of photoregulation in a **monolayer** system mixed with **liquid crystal** and azobenzene polymer using a displacement-current measuring technique

AU Naruse, Haruhiko; Yoshida, Hisashi; Ohnishi, Koji; Iwamoto, Mitsumasa; Ichimura, Kunihiro

CS Department of Physical Electronics, Tokyo Institute of Technology, 2-12-1, O-okayama, Meguro-ku, Tokyo, 152, Japan

SO Thin Solid Films (1994), 244(1-2), 1018-21

CODEN: THSFAP; ISSN: 0040-6090

DT Journal

LA English

AB The authors have investigated the photoregulation occurring in monolayer systems mixed with monolayers of poly(vinyl alc.)s bearing azobenzene sides (6Az5PVA) and liquid crystal (LC). For a mixed monolayer system with trans-6Az5PVA and LC mesogenic mols., transient-displacement-current pulses originating in the orientational change of the LC mesogenic mols. were not observed, although transient-displacement-current pulses due to the photoisomerization of 6Az5PVA monolayers were detected for a monolayer system mixed with LC mesogenic mols. possessing dielec. anisotropy. In contrast, for a cis-6Az5PVA monolayer mixed with LC mesogenic mols., transient-displacement-current pulses originating in the orientational change of LC mesogenic mols. were observed during the initial photoirradn. cycle with visible light.

CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)

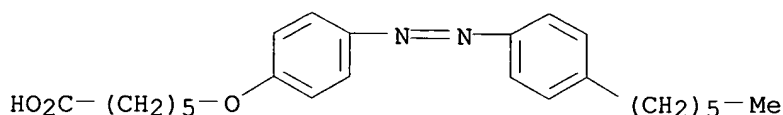
IT Electric current
(displacement, transient, from azobenzene polymer **monolayers** mixed with **liquid crystal** mols., photocontrol of orientation changes by)

IT Optical imaging **devices**
(electrooptical liquid-crystal, **photoregulation** of **alignment** of, by azobenzene polymer, displacement-current

measuring technique for detection of)
 IT 121886-83-7
 RL: USES (Uses)
 (photoregulation of **liquid crystal** orientation in
monolayer with, displacement-current measuring technique of)
 IT 121886-83-7
 RL: USES (Uses)
 (photoregulation of **liquid crystal** orientation in
monolayer with, displacement-current measuring technique of)
 RN 121886-83-7 HCAPLUS
 CN Ethenol, homopolymer, 6-[4-[(4-hexylphenyl)azo]phenoxy]hexanoate (9CI)
 (CA INDEX NAME)

CM 1

CRN 134509-34-5
 CMF C24 H32 N2 O3

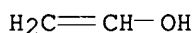


CM 2

CRN 9002-89-5
 CMF (C2 H4 O)x
 CCI PMS

CM 3

CRN 557-75-5
 CMF C2 H4 O



L48 ANSWER 33 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1994:422339 HCAPLUS
 DN 121:22339
 TI **Alignment photoregulation** of liquid crystals on
 precisely area controlled azobenzene Langmuir-Blodgett monolayers
 AU Seki, T.; Fukuda, R.; Tamaki, T.; Ichimura, K.
 CS National Institute of Materials and Chemical Research, 1-1 Higashi,
 Tsukuba, Ibaraki, 305, Japan
 SO Thin Solid Films (1994), 243(1-2), 675-8
 CODEN: THSFAP; ISSN: 0040-6090
 DT Journal
 LA English
 AB Single Langmuir-Blodgett monolayers of an azobenzene (Az) side chain
 amphiphilic polymer are prepared with various monolayer areas ranging from
 0.30 to 1.20nm² per Az unit at the air-water interface. **Alignment**
photoregulation of a nematic liquid crystal (LC) is investigated
 using these precisely area controlled Az layers. It is newly found here

that photoresponding behaviors, such as (i) the magnitude of tilt angle changes, (ii) the in-plane orientation of LC mols. with respect to the dipping direction on UV irradiation, and (iii) the reorienting behaviors effected by the polarized UV light, are influenced by the Az packing d. in crucial ways. On the basis of the above LC response behaviors, the Az monolayer can be categorized into four area regions that should be of particular importance in the understanding and design of photocommanding Az layers.

CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)
Section cross-reference(s): 66, 75

ST **alignment photoregulation** liq crystal azobenzene
polymer; Langmuir Blodgett monolayer photoisomerization command surface

IT Isomerization
(cis-trans, photochem., in Langmuir-Blodgett monolayers of azobenzene-group containing poly(vinyl alc.) ester, **photoregulation** of **alignment** of liquid crystals based on)

IT Optical imaging **devices**
(electrooptical liquid-crystal, **photoregulation** of **alignment** of, by Langmuir-Blodgett monolayers of azobenzene-group containing poly(vinyl alc.) ester)

IT Liquid crystals
(nematic, **photoregulation** of **alignment** of, by Langmuir-Blodgett monolayers of azobenzene-group containing poly(vinyl alc.) ester)

IT 102184-99-6, LCD-118
RL: USES (Uses)
(**photoregulation** of **alignment** of liquid crystal composition doped with, by Langmuir-Blodgett monolayers of azobenzene-group containing poly(vinyl alc.) ester)

IT **121886-84-8**
RL: USES (Uses)
(**photoregulation** of **alignment** of liquid **crystals** controlled by Langmuir-Blodgett **monolayers** of)

IT 115288-48-7, DON-103
RL: USES (Uses)
(**photoregulation** of **alignment** of, by Langmuir-Blodgett monolayers of azobenzene-group containing poly(vinyl alc.) ester)

IT **121886-84-8**
RL: USES (Uses)
(**photoregulation** of **alignment** of liquid **crystals** controlled by Langmuir-Blodgett **monolayers** of)

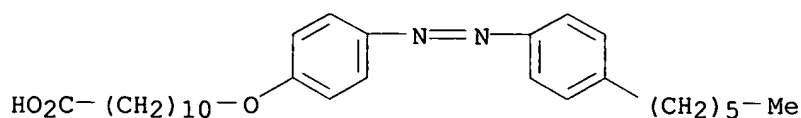
RN 121886-84-8 HCAPLUS

CN Ethenol, homopolymer, 11-[4-[(4-hexylphenyl)azo]phenoxy]undecanoate (9CI)
(CA INDEX NAME)

CM 1

CRN 115271-05-1

CMF C29 H42 N2 O3

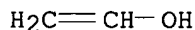


CM 2

CRN 9002-89-5
CMF (C₂ H₄ O)_x
CCI PMS

CM 3

CRN 557-75-5
CMF C₂ H₄ O

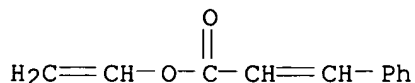


L48 ANSWER 34 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1994:257271 HCAPLUS
DN 120:257271
TI Photosensitive orientants for liquid crystal alignment
AU Marusii, T. Ya.; Reznikov, Yu. A.
CS Inst. Phys., Kiev, 252650, Ukraine
SO Molecular Crystals and Liquid Crystals Science and Technology, Section C:
Molecular Materials (1993), 3(2), 161-8
CODEN: MOMAEO; ISSN: 1058-7276
DT Journal
LA English
AB The well-known photoresist material, poly(vinyl cinnamate) was used as a
photosensitive orientant for conventional liquid crystals. The possibility
of the control of liquid crystal planar alignment by an optically induced
change of boundary conditions has been demonstrated.
CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and
Other Reprographic Processes)
ST polyvinylcinnamate **photoresist alignment** liq crystal
IT Liquid crystals
(**photocontrol of alignment** of, by poly(vinyl
cinnamate) photosensitive orientation layer)
IT Optical imaging **devices**
(electrooptical **liquid-crystal**,
photosensitive alignment layer from
poly(vinyl cinnamate) photoresist for)
IT 40817-08-1, 5CB 97402-82-9, Mbba 99638-95-6, ZhK 807 137398-87-9,
ZhK 1285
RL: USES (Uses)
(**photocontrol of alignment** of, by poly(vinyl
cinnamate) photosensitive orientation layer)
IT **24968-99-8**, Poly(vinyl cinnamate)
RL: USES (Uses)
(**photocontrol of liquid crystal alignment** by)
IT **24968-99-8**, Poly(vinyl cinnamate)
RL: USES (Uses)

(photocontrol of liquid crystal alignment by)
 RN 24968-99-8 HCAPLUS
 CN 2-Propenoic acid, 3-phenyl-, ethenyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 3098-92-8
 CMF C11 H10 O2



L48 ANSWER 35 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1994:257266 HCAPLUS
 DN 120:257266
 TI Photoregulation of liquid-crystalline orientation by anisotropic photochromism of surface azobenzenes
 AU Kawanishi, Yuji; Tamaki, Takashi; Ichimura, Kunihiro
 CS Natl. Inst. Mater. Chem. Res., Agency Ind. Sci. Technol., Tsukuba, 305, Japan
 SO ACS Symposium Series (1994), 537(Polymer for Microelectronics), 453-65
 CODEN: ACSMC8; ISSN: 0097-6156
 DT Journal
 LA English
 AB Liquid crystals (LC) are fluid with highly ordered mol. orientation. Because of their responsiveness in orientation as well as in optical properties to an applied elec. field, LCs have been materialized in production of thin displays driven by small batteries. The LC orientation is also influenced by bringing other mols. into the system, i.e., dopants and substrate surfaces. This makes special orientation in marketed LC displays possible such as twisted nematic, super twisted nematic, surface stabilized ferroelec., and dye doped guest-host systems, etc. Any mechanisms modifying the physicochem. nature of mols. on the surface will be available to control the LC orientation. Introduction of photochem. is particularly interesting since it enables the authors to acquire high d. and fast accessible optical memories as well as new sights on mol. interactions in the LC phase. Here, photochem. approaches to regulate the LC orientation are briefly reviewed. Afterwards, the authors' new findings on precise 3D control of the LC orientation by anisotropic surface photochromism will be introduced.
 CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)
 Section cross-reference(s): 75
 ST liq crystal **photoalignment** surface azobenzene **photochromism**; photoisomerization surface azobenzene deriv display orientation
 IT Optical imaging **devices**
 (electrooptical **liquid-crystal**, photoinduced regulation of **layers** orientation in, by photochromism of surface attached azobenzenes)
 IT **114556-72-8** 154617-62-6
 RL: USES (Uses)
 (photoregulation of orientation of nematic liquid crystal mixture by anisotropic photochromism of surface attached)

IT 114556-72-8

RL: USES (Uses)

(photoregulation of orientation of nematic liquid crystal mixture by anisotropic photochromism of surface attached)

RN 114556-72-8 HCAPLUS

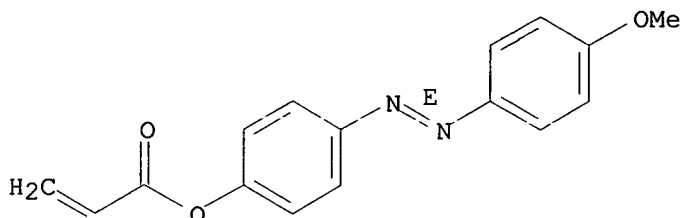
CN 2-Propenoic acid, 4-[(4-methoxyphenyl)azo]phenyl ester, (E)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 114556-71-7

CMF C16 H14 N2 O3

Double bond geometry as shown.



L48 ANSWER 36 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1994:232255 HCAPLUS

DN 120:232255

TI Photocrosslinkable composition for **liquid crystal** alignment **layer** preparation

IN Noonan, John M.

PA Eastman Kodak Co., USA

SO U.S., 7 pp.

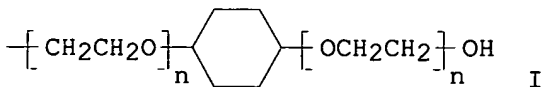
CODEN: USXXAM

DT **Patent**

LA English

FAN.CNT 1

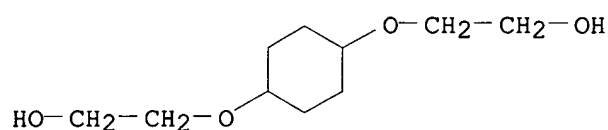
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5213853	A	19930525	US 1991-799472	19911126 <--
	EP 544285	A1	19930602	EP 1992-120194	19921126 <--
	EP 544285	B1	19960410		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LI, LU, MC, NL, PT, SE				
	JP 05241152	A2	19930921	JP 1992-317039	19921126 <--
	JP 2592201	B2	19970319		
PRAI	US 1991-799472	A	19911126	<--	
GI					



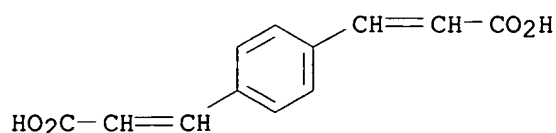
AB A photocrosslinkable composition for forming alignment **layers** for ferroelec. **liquid-crystal devices** comprises a polyester derived from 1,4-phenylene bis(2-acrylic acid) and ≥ 1

aliphatic glycol that does not contain any aromatic dibasic acid component or ≥ 1 aliphatic diol represented by the formula HOR (R = I where n = an integer of 1-4) and a biscoumarin Ketone sensitizer.

IC ICM G02F001-1337
 NCL 428001000
 CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)
 ST **photocrosslinkable polyester alignment layer**
liq crystal
 IT Optical imaging **devices**
 (electrooptical **liquid-crystal, alignment**
layers for, **photocrosslinkable** compns. containing
 phenylene bis(acrylic acid)-aliphatic glycol polyesters for preparation of)
 IT 67135-48-2
 RL: USES (Uses)
 (photocrosslinkable compns. containing phenylene bis(acrylic acid)-aliphatic
 glycol polyesters and, for preparation of alignment **layers** for
liquid-crystal display devices)
 IT 53710-66-0 58608-19-8 153846-23-2
 153846-24-3 153846-25-4
 RL: USES (Uses)
 (photosensitive compns. containing, for preparation of alignment **layers**
 for **liquid-crystal display devices**)
 IT 53710-66-0 58608-19-8 153846-23-2
 153846-24-3 153846-25-4
 RL: USES (Uses)
 (photosensitive compns. containing, for preparation of alignment **layers**
 for **liquid-crystal display devices**)
 RN 53710-66-0 HCAPLUS
 CN 2-Propenoic acid, 3,3'-(1,4-phenylene)bis-, polymer with
 2,2'-[1,4-cyclohexanediylbis(oxy)]bis[ethanol] (9CI) (CA INDEX NAME)
 CM 1
 CRN 16394-44-8
 CMF C10 H20 O4

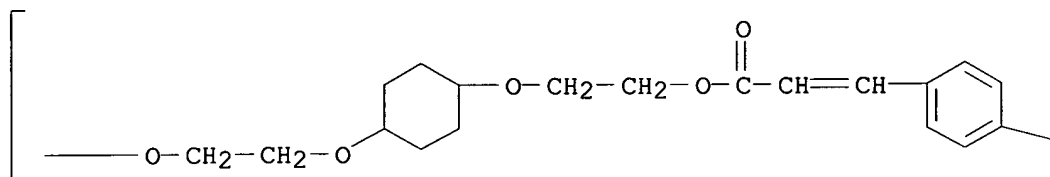


CM 2
 CRN 16323-43-6
 CMF C12 H10 O4

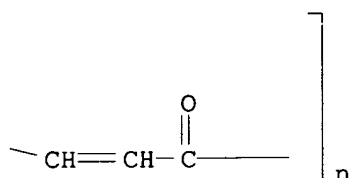


RN 58608-19-8 HCAPLUS
 CN Poly[oxy-1,2-ethanediyl-oxy-1,4-cyclohexanediyl-oxy-1,2-ethanediyl-oxy(1-oxo-2-propene-1,3-diyl)-1,4-phenylene(3-oxo-1-propene-1,3-diyl)] (9CI) (CA INDEX NAME)

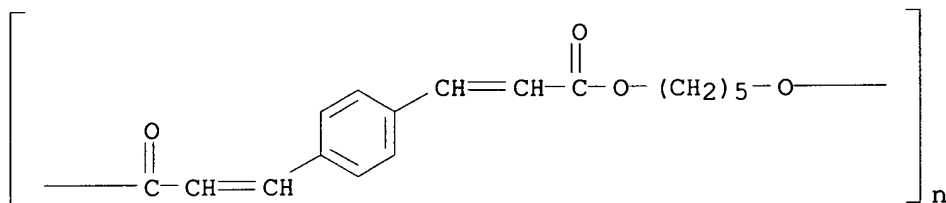
PAGE 1-A



PAGE 1-B



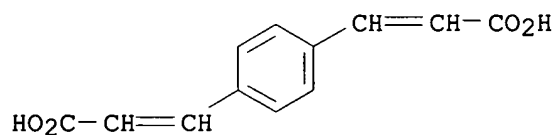
RN 153846-23-2 HCAPLUS
 CN Poly[oxy-1,5-pentanediyloxy(1-oxo-2-propene-1,3-diyl)-1,4-phenylene(3-oxo-1-propene-1,3-diyl)] (9CI) (CA INDEX NAME)



RN 153846-24-3 HCAPLUS
 CN 2-Propenoic acid, 3,3'-(1,4-phenylene)bis-, polymer with 1,5-pentanediol (9CI) (CA INDEX NAME)

CM 1

CRN 16323-43-6
 CMF C12 H10 O4



CM 2

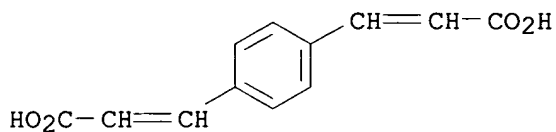
CRN 111-29-5
CMF C5 H12 O2

HO-(CH₂)₅-OH

RN 153846-25-4 HCAPLUS
CN Hexanedioic acid, polymer with 1,5-pentanediol and 3,3'-(1,4-phenylene)bis[2-propenoic acid] (9CI) (CA INDEX NAME)

CM 1

CRN 16323-43-6
CMF C12 H10 O4



CM 2

CRN 124-04-9
CMF C6 H10 O4

HO₂C-(CH₂)₄-CO₂H

CM 3

CRN 111-29-5
CMF C5 H12 O2

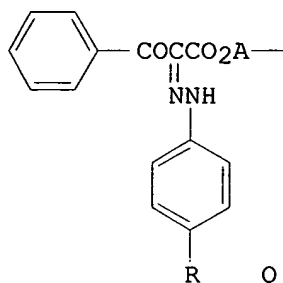
HO-(CH₂)₅-OH

L48 ANSWER 37 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1993:202222 HCAPLUS
DN 118:202222
TI Liquid-crystal **devices** with optically and thermally structure-changeable alignment-controlling films from β-keto acid moiety-containing polymers
IN Ichimura, Kunihiro; Kawanishi, Yuji; Seki, Takahiro; Tamaoki, Takashi; Yamamura, Shigeo
PA Agency of Industrial Sciences and Technology, Japan
SO Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF
DT **Patent**

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 04284445	A2	19921009	JP 1991-72064	19910313 <--
	JP 06058507	B4	19940803		
PRAI	JP 1991-72064		19910313	<--	
GI					



- AB Optical **devices**, which have polymer films from poly(meth)acrylates, poly(vinyl acetals), poly(vinyl ethers), or polysiloxanes having β -keto acid moiety Q [R = alkyl, alkoxy, alkylamino; A = (CH₂)_n, ≥ 1 CH₂ may be replaced with CO₂, CONH, NH, CO] as the side chain in contact with a **liquid crystal layer**, form patterns by light or heat and the optically or thermally formed pattern is erased by heat or light, resp. Light- or heat-induced structural change in the β -keto acid moiety results in change between homogeneous orientation and homeotropic orientation of liquid crystal mols. The optical **devices** are useful for optical memory **devices** and light-addressing display **devices**.
- IC ICM G03C001-73
ICS B41M005-26; G02F001-13; G02F001-133; G02F001-1337; G11B007-24
- CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)
Section cross-reference(s): 38
- ST liq crystal **device** alignment film; photochromic film liq crystal **device**
- IT Recording materials
(liquid-crystal, **photochromic alignment**-controlling films from β -keto acid moiety-containing polymers for)
- IT Photochromic substances
(β -keto acid moiety-containing polymers, for alignment-controlling films for liquid-crystal display **devices**)
- IT Optical imaging **devices**
(electrooptical liquid-crystal, **photochromic alignment**-controlling films from β -keto acid moiety-containing polymers)
- IT 147025-75-0P 147025-77-2P 147025-85-2P 147041-43-8P 147237-83-0P
147237-84-1P 147237-85-2P 147237-86-3P 147237-87-4P 147237-88-5P
RL: RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(preparation and polymerization of, **photochromic** polymers for **alignment**-controlling films for liquid-crystal **devices** from)
- IT 540-51-2P, Ethylene bromohydrin 1611-56-9P, 11-Bromoundecanol 4286-55-9P 147025-69-2P 147025-71-6P 147025-73-8P 147237-82-9P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT

(Reactant or reagent)
 (preparation and reaction of, in preparation of **photochromic** polymers
 for **alignment**-controlling films for liquid-crystal
devices)

IT 147237-92-1P
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
 (Reactant or reagent)
 (preparation and reaction of, in preparation of **photochromic** polymers
 for **alignment**-controlling films for liquid-crystal display
devices)

IT 147237-89-6P 147237-90-9P
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
 (Reactant or reagent)
 (preparation and reaction of, with poly(vinyl alc. or acetal),
photochromic polymers for **alignment**-controlling films
 for liquid-crystal **devices** from)

IT 147025-70-5P 147025-72-7P 147025-74-9P
 147025-76-1P 147025-78-3P 147025-80-7P 147025-82-9P
 147025-84-1P 147025-86-3P 147041-44-9P
 RL: PREP (Preparation)
 (preparation of, for **photochromic alignment**-controlling
 films for liquid-crystal display **devices**)

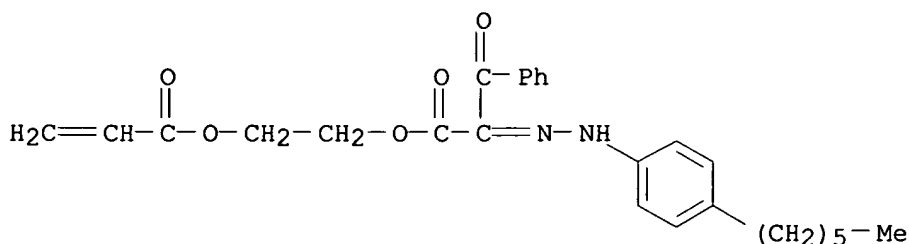
IT 94-02-0, Benzoylacetic acid ethyl ester 814-68-6, 2-Propenoyl chloride
 919-30-2 920-46-7, Methacrylic chloride 1067-48-7 4224-70-8,
 6-Bromocaproic acid 5292-43-3, tert-Butyl bromoacetate 16245-79-7,
 p-Octylaniline 33228-45-4, p-Hexylaniline 39905-44-7,
 p-Heptyloxyaniline 147237-81-8 147237-91-0
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (reaction of, in preparation of **photochromic** polymers for
alignment-controlling films for liquid-crystal display
devices)

IT 147025-70-5P 147025-72-7P 147025-74-9P
 147025-76-1P 147025-78-3P 147025-84-1P
 147025-86-3P 147041-44-9P
 RL: PREP (Preparation)
 (preparation of, for **photochromic alignment**-controlling
 films for liquid-crystal display **devices**)

RN 147025-70-5 HCAPLUS
 CN Benzenepropanoic acid, α -[(4-hexylphenyl)hydrazono]- β -oxo-,
 2-[(1-oxo-2-propenyl)oxy]ethyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 147025-69-2
 CMF C26 H30 N2 O5



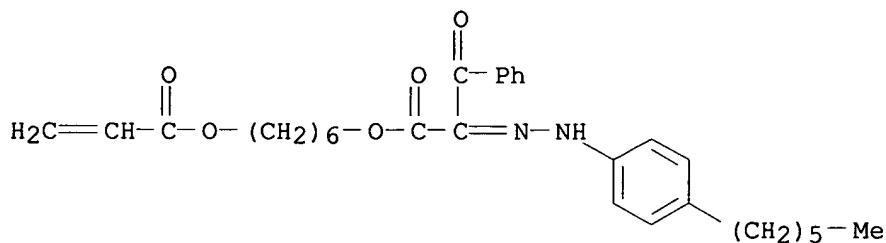
RN 147025-72-7 HCAPLUS

CN Benzenepropanoic acid, α -[(4-hexylphenyl)hydrazono]- β -oxo-,
6-[(1-oxo-2-propenyl)oxy]hexyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 147025-71-6

CMF C30 H38 N2 O5



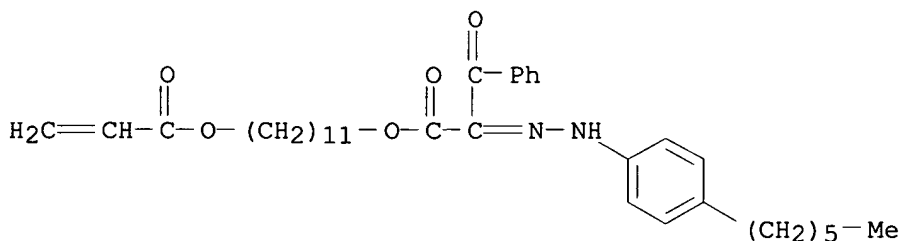
RN 147025-74-9 HCAPLUS

CN Benzenepropanoic acid, α -[(4-hexylphenyl)hydrazono]- β -oxo-,
11-[(1-oxo-2-propenyl)oxy]undecyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 147025-73-8

CMF C35 H48 N2 O5



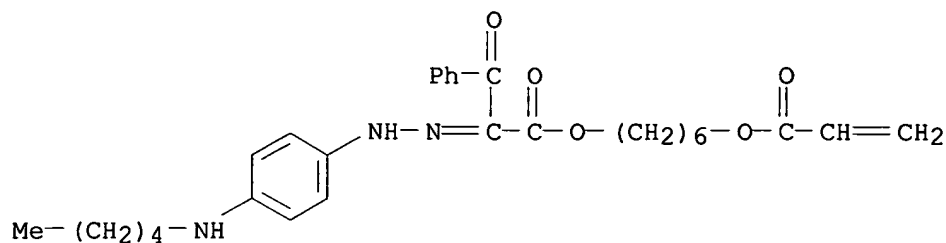
RN 147025-76-1 HCAPLUS

CN Benzenepropanoic acid, β -oxo- α -[[4-(pentylamino)phenyl]hydrazono]-, 6-[(1-oxo-2-propenyl)oxy]hexyl ester,
homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 147025-75-0

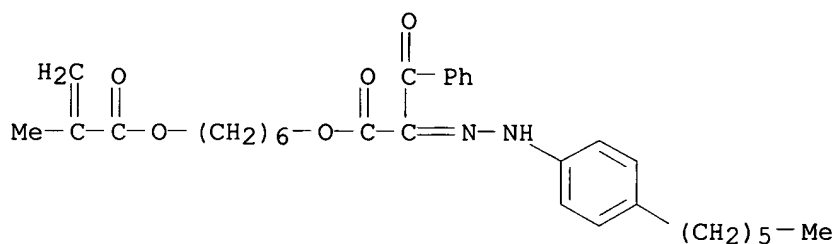
CMF C29 H37 N3 O5



RN 147025-78-3 HCAPLUS
 CN Benzenepropanoic acid, α -[(4-hexylphenyl)hydrazono]- β -oxo-,
 6-[(2-methyl-1-oxo-2-propenyl)oxy]hexyl ester, homopolymer (9CI) (CA
 INDEX NAME)

CM 1

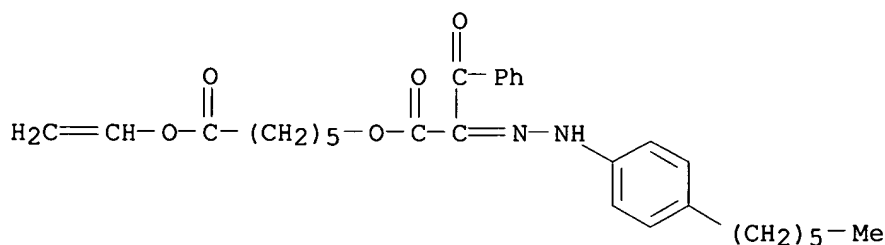
CRN 147025-77 2
 CMF C31 H40 N2 O5



RN 147025-84-1 HCAPLUS
 CN Benzenepropanoic acid, α -[(4-hexylphenyl)hydrazono]- β -oxo-,
 6-(ethenyloxy)-6-oxohexyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 147025-83-0
 CMF C29 H36 N2 O5

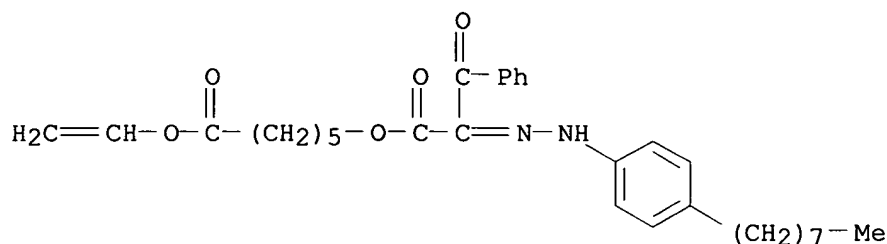


RN 147025-86-3 HCAPLUS
 CN Benzenepropanoic acid, α -[(4-octylphenyl)hydrazono]- β -oxo-,
 6-(ethenyloxy)-6-oxohexyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 147025-85-2

CMF C31 H40 N2 O5



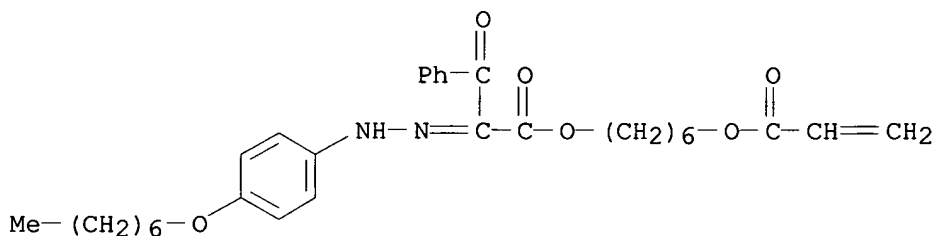
RN 147041-44-9 HCAPLUS

CN Benzenepropanoic acid, α -[[4-(heptyloxy)phenyl]hydrazono]- β -oxo-, 6-[(1-oxo-2-propenyl)oxy]hexyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 147041-43-8

CMF C31 H40 N2 O6



L48 ANSWER 38 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1993:201900 HCAPLUS

DN 118:201900

TI Alignment control of a liquid crystal on a photosensitive poly(vinyl alcohol) film

AU Imura, Yasufumi; Kusano, Junichi; Kobayashi, Shunsuke; Aoyagi, Yoshinobu; Sugano, Takuo

CS Fac. Technol., Tokyo Univ. Agric. Technol., Koganei, 184, Japan

SO Japanese Journal of Applied Physics, Part 2: Letters (1993), 32(1A-B), L93-L96

CODEN: JAPLD8; ISSN: 0021-4922

DT Journal

LA English

AB The photoinduced optical anisotropy of an azo dye-doped poly(vinyl alc.) film was used for controlling the azimuthal alignment of a liquid crystal. The dynamic behaviors of the optical transmission of the film and of a **liquid crystal layer** aligned on the film are studied using linearly polarized pumping (Ar⁺ laser) and probing (He-Ne laser) beams. The azo dye-doped poly(vinyl alc.) film memorizes the information on the polarization direction of the exciting laser beam and

the resulting anisotropy induced in the film causes adjacent liquid crystal mols. on the film to rotate azimuthally.

CC 74-13 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)

ST liq crystal **alignment photosensitive** polyvinyl alc;
azo dye polyvinyl alc alignment display; photoinduced optical anisotropy
azo dye polymer

IT Optical imaging **devices**
(electrooptical liquid-crystal, alignment control of, using photoinduced optical anisotropy of azo dye-doped poly(vinyl alc.) film)

IT 40817-08-1, 5CB
RL: USES (Uses)
(electrooptical display containing, **photoinduced alignment** control of, by poly(vinyl alc.) film doped with azo dye)

IT **9002-89-5**, Poly(vinyl alcohol)
RL: USES (Uses)
(photoinduced optical anisotropy of azo dye-doped film of, control of liquid crystal alignment by)

IT **9002-89-5**, Poly(vinyl alcohol)
RL: USES (Uses)
(photoinduced optical anisotropy of azo dye-doped film of, control of liquid crystal alignment by)

RN 9002-89-5 HCAPLUS

CN Ethenol, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 557-75-5

CMF C2 H4 O

 $\text{H}_2\text{C}=\text{CH}-\text{OH}$

L48 ANSWER 39 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1993:49004 HCAPLUS

DN 118:49004

TI "Command surfaces" of Langmuir-Blodgett films. Photoregulations of liquid crystal alignment by molecularly tailored surface azobenzene layers

AU Seki, Takahiro; Sakuragi, Masako; Kawanishi, Yuji; Tamaki, Takashi; Fukuda, Ryoichi; Ichimura, Kunihiro; Suzuki, Yasuzo

CS Res. Inst. Polym. Text., Tsukuba, 305, Japan

SO Langmuir (1993), 9(1), 211-18

CODEN: LANGD5; ISSN: 0743-7463

DT Journal

LA English

AB Reversible homeotropic .dblarw. planar **photochem.**

alignment controls of a nematic liquid crystal (LC) are studied using photochromic command layers comprised of Langmuir-Blodgett (LB) films of side chain type azobenzene (Az) amphiphilic polymers. Photoresponses of the LC alignment are examined by changing such details as the mol. structure of the LB films, number of deposited layers, 2-dimensional d. of Az units, the deposition method, and the method of light irradiation. It is confirmed by this LB study that single Az monolayers are sufficient to induce LC alignment changes, provided that the Az unit is separated from the poly(vinyl alc.) backbone by a methylene spacer of adequate length. The effect of the spacer length on the commanding ability can be correlated to

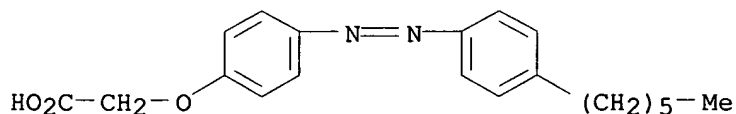
UV-visible spectral changes of Az monolayers upon contact with LC mols. As for the packing d. of the Az unit on the substrate, photoregulation requires an area of <1.0 nm² per Az unit. Both vertical dipping and horizontal lifting methods are applicable to obtain photoresponsive LC cells; however, preparation by the vertical dipping is more beneficial in that homogeneously aligning LB films are obtained on which LC mols. are oriented parallel to the dipping direction. Irradiation of linearly polarized UV light induces subsequent reorientation of LC mols. directing orthogonal to the polarization plane. This reorientation behavior is strongly dependent on the spacer length of the Az LB films and deposition nos.

- CC 74-1 (Radiation Chemistry, Photochemistry, and **Photographic** and Other Reprographic Processes)
Section cross-reference(s): 75
- ST command surface Langmuir Blodgett film photolysis; liq crystal **alignment photoregulation** azobenzene; photochromism
Langmuir Blodgett **layer liq crystal**
- IT Optical imaging **devices**
(electrooptical liquid-crystal, **photoregulation** of **alignment** in, using polymeric Langmuir-Blodgett films of azobenzene derivative and poly(vinyl alc.))
- IT Liquid crystals
(nematic, **photoregulation** of **alignment** of, by **photochromic** Langmuir-Blodgett films of azobenzene derivative - vinyl alc. polymer)
- IT **120112-81-4 121886-83-7 121886-84-8**
RL: USES (Uses)
(photoreactive Langmuir-Blodgett films from, for alignment control of nematic liquid crystals)
- IT 73255-62-6 108067-17-0 108067-18-1 115288-48-7 143596-92-3
RL: USES (Uses)
(**photoregulation** of **alignment** of liquid crystal of, by azobenzene-poly(vinyl alc.) Langmuir-Blodgett films)
- IT **120112-81-4 121886-83-7 121886-84-8**
RL: USES (Uses)
(photoreactive Langmuir-Blodgett films from, for alignment control of nematic liquid crystals)
- RN 120112-81-4 HCAPLUS
- CN Ethenol, homopolymer, [4-[(4-hexylphenyl)azo]phenoxy]acetate (9CI) (CA INDEX NAME)

CM 1

CRN 120112-14-3

CMF C20 H24 N2 O3



CM 2

CRN 9002-89-5

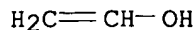
CMF (C2 H4 O)_x

CCI PMS

CM 3

CRN 557-75-5

CMF C2 H4 O



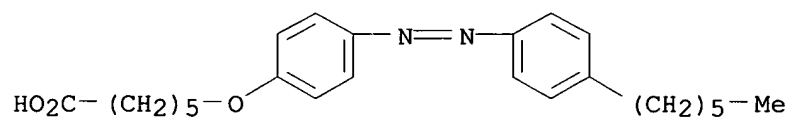
RN 121886-83-7 HCAPLUS

CN Ethenol, homopolymer, 6-[4-[(4-hexylphenyl)azo]phenoxy]hexanoate (9CI)
(CA INDEX NAME)

CM 1

CRN 134509-34-5

CMF C24 H32 N2 O3



CM 2

CRN 9002-89-5

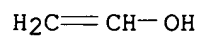
CMF (C2 H4 O)_x

CCI PMS

CM 3

CRN 557-75-5

CMF C2 H4 O



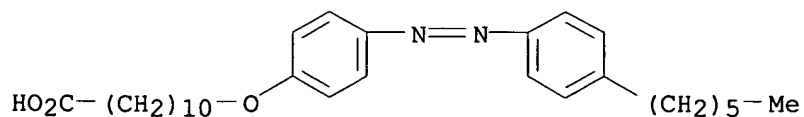
RN 121886-84-8 HCAPLUS

CN Ethenol, homopolymer, 11-[4-[(4-hexylphenyl)azo]phenoxy]undecanoate (9CI)
(CA INDEX NAME)

CM 1

CRN 115271-05-1

CMF C29 H42 N2 O3



CM 2

CRN 9002-89-5
CMF (C2 H4 O)x
CCI PMS

CM 3

CRN 557-75-5
CMF C2 H4 O

H₂C=CH-OH

L48 ANSWER 40 OF 40 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1991:666579 HCAPLUS
DN 115:266579
TI Photoregulation of **liquid crystal** alignment by
Langmuir-Blodgett **layers** of azobenzene polymers
AU Sakuragi, Masako; Seki, Takahiro; Kawanishi, Yuji; Tamaki, Takashi;
Ichimura, Kunihiro; Fukuda, Ryoichi; Hiramatsu, Hideo; Fujiwara, Kazuyoshi
CS Res. Inst. Polym. Text., Tsukuba, 305, Japan
SO Journal of Photopolymer Science and Technology (1991), 4(2), 279-82
CODEN: JSTEED; ISSN: 0914-9244
DT Journal
LA English
AB Anisotropic nature of a **liquid crystal**
(LC)/Langmuir-Blodgett (LB) **layer** of azobenzene pendant containing
poly(vinyl alc. ester) [Az-PVA] system were investigated. When Az was in
the trans form, all LC cells gave homeotropic alignment. Conversion to
the cis isomer upon UV (365 nm) irradiation brought about parallel
orientation, depending on the methylene spacer length in the polymer mol.
and the number of depositions. **Photoresponse** of LC
alignment was observed with a monolayer in the case of 10 spacer
groups in Az10-PVA (the longest spacer), but 3 and 5 layers were required
when Az5-PVA and Az1-PVA were employed resp. Repeated deposition gave
homogeneous orientation aligned parallel to the dipping direction of LB
preparation Among photoresponsive cells the reorienting effect was clearly
observed only with monolayered Az10-PVA and 3-layered Az5-PVA. At further
deposition the direction coincided with the dipping direction and was
unaffected by the illumination of polarized lights.
CC 74-5 (Radiation Chemistry, Photochemistry, and **Photographic** and
Other Reprographic Processes)
ST liq crystal **alignment photoisomerization** azobenzene
polymer
IT Liquid crystals
(**photoinduced** regulation of **alignment** of, using
Langmuir-Blodgett layers of azobenzene-containing polymer)
IT Optical imaging **devices**
(electro-, liquid-crystal, alignment regulation in, using
photoisomerization of azobenzene-containing polymer)
IT **137515-31-2 137515-35-6 137515-37-8**
RL: USES (Uses)
(photoregulation of **liquid crystal** alignment by
Langmuir-Blodgett **layers** of)
IT **137515-31-2 137515-35-6 137515-37-8**
RL: USES (Uses)
(photoregulation of **liquid crystal** alignment by

Langmuir-Blodgett **layers** of)

RN 137515-31-2 HCAPLUS

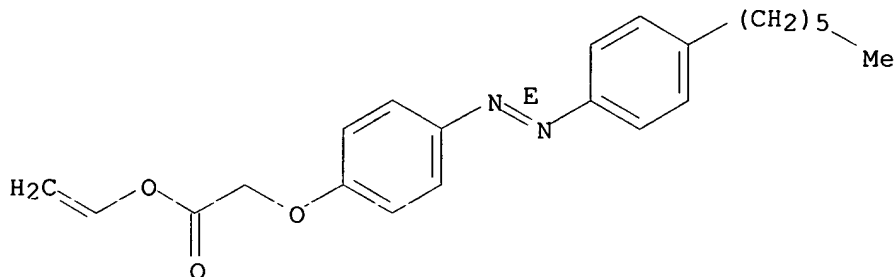
CN Acetic acid, [4-[(4-hexylphenyl)azo]phenoxy]-, ethenyl ester, (E)-, polymer with ethenol (9CI) (CA INDEX NAME)

CM 1

CRN 137515-30-1

CMF C22 H26 N2 O3

Double bond geometry as shown.



CM 2

CRN 557-75-5

CMF C2 H4 O

H₂C=CH-OH

RN 137515-35-6 HCAPLUS

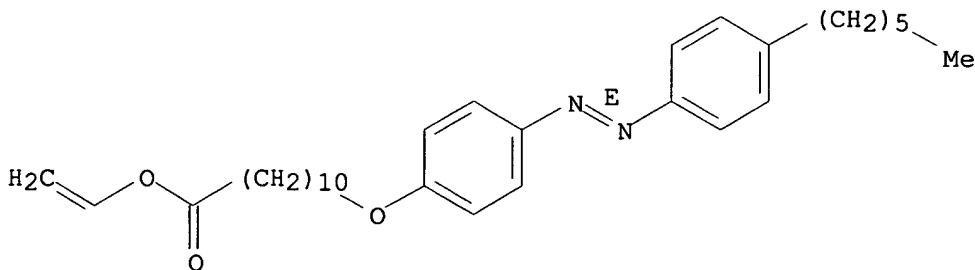
CN Undecanoic acid, 11-[4-[(1E)-(4-hexylphenyl)azo]phenoxy]-, ethenyl ester, polymer with ethenol (9CI) (CA INDEX NAME)

CM 1

CRN 137515-34-5

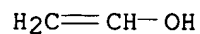
CMF C31 H44 N2 O3

Double bond geometry as shown.



CM 2

CRN 557-75-5
CMF C2 H4 O

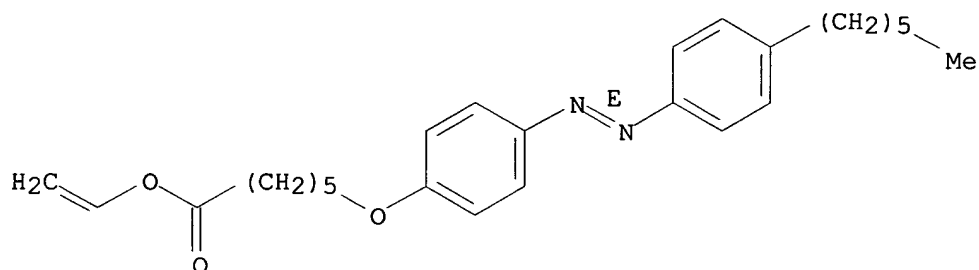


RN 137515-37-8 HCAPLUS
CN Hexanoic acid, 6-[4-[(4-hexylphenyl)azo]phenoxy]-, ethenyl ester, (E)-,
polymer with ethenol (9CI) (CA INDEX NAME)

CM 1

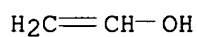
CRN 137515-36-7
CMF C26 H34 N2 O3

Double bond geometry as shown.



CM 2

CRN 557-75-5
CMF C2 H4 O



=>